ERRATA FOR MISCELLANEOUS PAPER 107

The following errors have been detected on p.136 and should be corrected.

1) In right-hand column, paragraph 1, Cobalt Mines Metals should read Cobalt Minor Metals.

2) In right-hand column, paragraph 2 should read:
Mineral commodities mines in 1982 included silver (1 008 425 ounces), iron ore pellets 863 000 tonnes [metric tons], copper (52 306 pounds), limestone (2101 tonnes [metric tons]), decorative building stone (1500 tonnes [metric tons]).

Ontario Geological Survey
Miscellaneous Paper 107

Report of Activities Regional and Resident Geologists 1982

Edited by

C.R. Kustra

1983

Ontario

Ministry of Natural Resources

Hon. Alan W. Pope
Minister

W T Foster
Deputy Minister

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Parts of this publication may be quoted if credit is given. It is recommended that reference to this report be made in the following form for each individual author:

Blackburn, C.E.
1983: 1982 Report of the Kenora Resident Geologist; p. 1-19 *in* Report of Activities, Regional and Resident Geologists, 1982, edited by C.R. Kustra, Ontario Geological Survey, Miscellanous Paper 107, 211p.

Scientific Editor: Guy Kendrick

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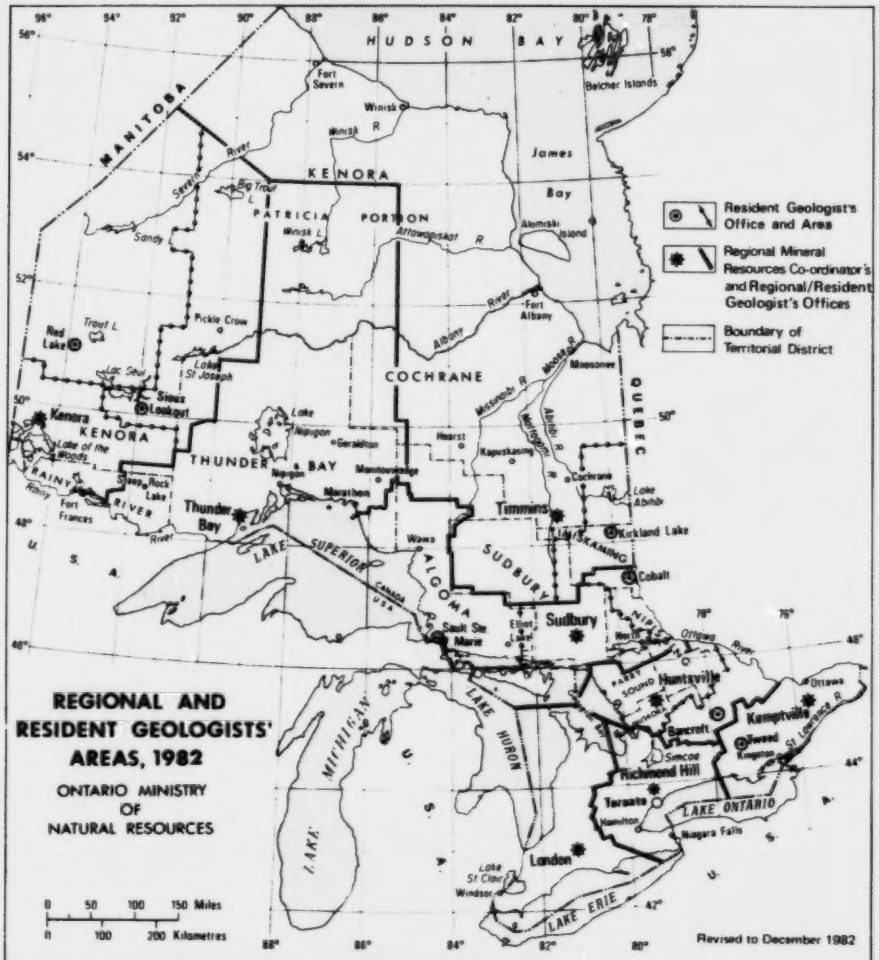
FOREWORD

This report, summarizing the activities of Regional and Resident Geologists for the period January 1, 1982, to November 30, 1982, is an account of mining and exploration activities in Ontario prepared from information collected and filed for that period by the Ministry of Natural Resources Regional and Resident Geologists. Listings of new additions to the Assessment Files records, and reports of government survey and university sponsored projects are provided.

Regional and Resident Geologists are located in various centres of the Province to provide geoscience information and advice to the public on the geology and mineral deposits of Ontario. Each office maintains a library of published and unpublished reports. These libraries contain: publications of the Ontario Geological Survey, other government agencies, records of exploration activity submitted for assessment work credit, company prospectuses and reports from the files of the Ontario Securities Commission, reports of property visits made by the Regional or Resident Geologists, and other staff geologists and information received directly from companies and individuals. These libraries can be consulted freely by the public.

Dr. G. Patterson assumed responsibilites as Resident Geologist at Thunder Bay in early 1982.

C.R. Kustra
Liaison Geologist



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Northeastern Region	J.C. Wilson	10th fl., 199 Larch St., Sudbury P3E 5P9	(705) 675-4128
Algonquin Region	W.J. Logan	Brendale Sq., Box 9000, Huntsville P0A 1K0	(705) 789-9611
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LIST OF PUBLICATIONS (back pocket)

1982 Supplement of Bulletin 25, List of Publications.
Ontario Geological Survey, Ontario Ministry of Natural Resources.

Conversion Factors for Measurements in Ontario Geological Survey Publications

If the reader wishes to convert imperial units to SI (metric) units or SI units to imperial units the following multipliers should be used:

CONVERSION FROM SI TO IMPERIAL			CONVERSION FROM IMPERIAL TO SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
			LENGTH		
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709 7	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
			AREA		
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	$c,^2$
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
			VOLUME		
1 cm^3	0.061 02	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.308 0	cubic yards	1 cubic yard	0.764 555	m^3
			CAPACITY		
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
			MASS		
1 g	0.035 273 96	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 75	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 62	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 908 8**	t
			CONCENTRATION		
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

1 ounce (troy)/ton (short)	20.0	pennyweights/ton (short)
1 pennyweight/ton (short)	0.05	ounce (troy)/ton (short)

NOTE—Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries published by the Mining Association of Canada in cooperation with the Coal Association of Canada.

1982 Report of the Kenora Resident Geologist

C.E. Blackburn[1], and M.R. Hailstone[2]

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Introduction

The Resident Geologist's office is staffed by C.E. Blackburn, Resident Geologist, M.R. Hailstone, Resource Geologist, and M. Guderyan, Secretary. M.R. Hailstone commenced duties as Resource Geologist in March 1982. M. O'Flaherty, Experience '82 student technician, was employed during the summer months. C.C. Storey, employed under the NORDA (Northern Ontario Rural Development Agreement) incentives program, commenced duties under R.C. Beard, Mineral Resources Coordinator, Northwestern Region, May 1982, to undertake a Building Stone Inventory.

The sections of this report on the Building, Monumental, and Decorative Stone were written by C.C. Storey and R.C. Beard respectively.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Kenora.
[2]Resource Geologist, Ontario Ministry of Natural Resources, Kenora.

Resident Geologist's Activities

As part of the regular field program, several properties were visited that were undergoing development work. These included the property of Selco Incorporated, who held an option on Consolidated Professor Mines Limited's Duport Gold Property at Shoal Lake, and the Sakoose Gold Property southeast of Dryden, where J. Redden was establishing a heap leaching operation. Several other properties and areas were visited while undergoing active exploration. These are the Caswell-Williams Gold Property of Sherritt Gordon Mines Limited at Flint Lake; the Petrunka-Moorehouse Tungsten Property near Mavis Lake being evaluated by Sanmine Exploration Incorporated; the Wendigo Gold Mine, under option to Denison Mines Limited; an area within the English River Subprovince, north of Vermilion Bay, undergoing exploration for base metals by Noranda Mines Limited; the Fairservice Gold Property, currently under option to Noranda Mines Limited, at Straw Lake; tantalum-bearing pegmatites in the vicinity of Mavis and Gullwing Lakes, near Dryden; and gold properties under option to Sherritt Gordon Mines Limited in the Mine Centre area. Other inactive mineral showings, and prospects currently being evaluated were examined and reported upon during the year.

One producing mine outside the Kenora Resident Geologist's District was visited. This mine is the Goldlund Gold Mine in Echo Township, northeast of Dryden.

As part of the Ministry's public information program, geoscience lectures and field trips were provided for the Rough Rock, Gelley Lake, and Cuttle Lake Junior Ranger camps, and 3 local school groups. A Precambrian geology seminar involved geologists from the Ontario Geological Survey and staff from the Regional offices of the Ontario Ministry of Natural Resources. This seminar was held in Dryden in February 1982. Approximately 35 people, including representatives of the mining industry and prospectors attended.

Participation in the Ontario Ministry of Natural Resources Land Use Planning program continued. This was highlighted by the attendance of the Resident Geologist, in June, at public open houses on the optional land use plans for each of the Dryden, Kenora, Fort Frances, and Ignace Districts.

A 5-day field trip was run in conjunction with the Annual Meeting of the Geological Association of Canada, held in Winnipeg, in May. The field trip, co-led with geologists affiliated with the Ontario Geological Survey, was designed to provide an overview of the geology of the western part of the Wabigoon Subprovince, and its marginal relationship with the adjacent subprovinces. Blackburn presented a paper on the same topic at the technical sessions in Winnipeg.

C.C. Storey and R.C. Beard attended an Industrial Minerals Seminar in Ottawa in May 1982, and gave presentations on the Building Stone Inventory program.

Mining Activity

No metallic mineral production was recorded in 1982 from any of the mining properties in the Kenora Mining Division.

Quarrying for decorative stone continued at the Rush Bay Quarry west of Kenora. Quarrying of tombstone material continued at both the Universal Granite Centre (1976) Limited and the Nelson Monuments quarries near Vermilion Bay. Crushed rock was quarried at the White Quarry northwest of Kenora, but no production came from the Hawk Lake Quarry east of Kenora.

Production of horticultural peat by Arctic Peat Moss Corporation, near Barwick, continued during 1982, but at a lower than usual level because of long periods of wet weather.

Operations at the Eco Exploration Company Limited's Molybdenite Deposit located at High Lake, west of Kenora, were confined to running a mill test in June and July on 5000 tons of ore. The bulk of the ore was obtained from the High Lake Deposit, and 800 tons was obtained from a molybdenite property near Geraldton, Ontario. Construction of the mill plant, designed to process 200 tons per day, was completed late in 1981. No underground work was conducted at the High Lake mine site in 1982 where the shaft is currently sunk to 750 feet, with 3 levels having been developed.

Advanced exploration was carried out on the Duport Mine Gold Property of Consolidated Professor Mines Limited, on Cameron Island, Shoal Lake, under an agreement with Selco Incorporated. Selco Incorporated's activity was directed both at extending ore zones and proving up grade and tonnage figures on the old Duport Mine, and at conducting exploration in the Shoal Lake area in general. Under the agreement with Consolidated Professor Mines Limited, Selco Incorporated was to spend $900,000 on the property by April 1982, to be followed by an option by August 1982 to commit another $4 million to an underground program, or extend the August deadline for 1 year by paying Consolidated Professor Mines Limited $700,000 and spending a further $750,000 on exploration. At the height of the winter operation, 4 diamond drills were in operation, and geophysical surveys were conducted on a grid about 5 miles long by 1 mile wide on the ice at Shoal Lake. The winter's work resulted in a substantial increase in reserve estimates, to 2 million tons grading 0.31 ounce gold per ton. In total, 43 holes were diamond drilled in the winter program, totalling 28 000 feet. According to the Northern Miner, May 13, 1982, the

> . . . program outlined reserves in all categories of 1.2 million tons grading 0.30 oz. in the previously known Main zone, and 800,000 tons grading 0.33 oz. in the recently-discovered East zone.
>
> Drilling in the Main zone confirmed the mineralization over a length of 2,400 ft., including an additional 550 ft. indicated by new holes . . .
>
> The East zone, discovered by a single hole last year, was explored by 23 holes which outlined mineralization over 2,300 ft. . . .
>
> Reserves were calculated after allowance for mining dilution and a minimum width of four ft., using a cutoff grade of 0.15 oz. per ton. Both zones are open at a depth of 1,000 ft.
>
> Step-out exploratory drilling along the strike of the two mineralized zones resulted in significant intersections in six drill holes north of the reserve blocks spaced over a distance of 3,000 ft., and in two holes located 300 ft. and 900 ft. south of the reserve area. Values ranged from 0.10 to 0.40 oz. per ton over widths from 5-10 ft.

By the end of August 1982, Selco Incorporated elected to terminate it's development program on Consolidated Professor Mines Limited's Property. According to the latter company's president, and as reported in the Northern Miner, September 2, 1982, the measured dimensions of the deposit presently indicate an optimum production rate of 500 tons per day, to produce 50,000 oz. of gold annually. At year end, Selco Incorporated was planning to continue and expand the regional exploration project.

Development of a heap leaching operation proceeded at the Sakoose Mine Gold Property in the Tabor Lake area, southeast of Dryden. J.W. Redden has set up a leaching pad at the site, and intends to process ore from the main vein on the property.

Exploration Activity

The major exploration interest in 1982 has been for gold. This was also the case over the last 2 or 3 years. Approximately 83% of the claims staked up to November 30, 1982 were related to gold. Only 5% of claims staked could be attributed to base-metal exploration.

The balance of 12% was related to tungsten, asbestos, titanium, molybdenum, and tantalum-lithium mineralization. The level of prospecting and exploration measured by staking activity shows a decrease over 1981, undoubtedly related to the current economic climate and the somewhat reduced price of gold.

As in previous years, gold exploration has been concentrated in the Lake of the Woods, Kakagi Lake, Eagle Lake, Wabigoon-Manitou Lakes, and Mine Centre areas.

Base-metal exploration has centred on the Cliff Lake-Cedar Lake area, north of Vermilion Bay, Wabigoon Lake area, and the northwestern part of the Lake of the Woods.

Other commodities of exploration interest included asbestos at the Lake of the Woods, and tungsten and tantalum-lithium, both near Mavis Lake in the Dryden area.

Gold

In addition to their extensive work at the Duport Mine Gold Property of Consolidated Professor Mines Limited, Selco Incorporated carried out exploration for gold in the general vicinity of Shoal Lake, on a number of scattered claim groups. Their program in the Bluff Point Lake area on the Fairservice gold option, reported on in the 1981 Annual Report of the Regional and Resident Geologists, was curtailed following release of the option (Blackburn 1982).

Sherritt Gordon Mines Limited, from its exploration office in Dryden, has been assessing a number of its holdings over the year. The most important are the company's holdings in the Dogpaw Lake area, centred on the Caswell-Williams Deposit; and the company's new property acquisitions near Mine Centre, including the Ferguson, Foley, Manhatten, Decca, Lucky Coon, and McKenzie-Gray Properties.

Denison Mines Limited terminated the majority of its exploration work in the Kenora Resident Geologist's District early in 1982, but continued work on the Wendigo Mine into the summer, carrying out detailed geological mapping and a humic gold sampling survey.

Following an extensive exploration program in 1981 in the Rowan Lake area, Nuinsco Resources Limited was relatively inactive on its Cameron Lake Gold Property during 1982. However, the company still maintains a very high interest in this general area, and at the time of writing was acquiring other properties.

Noranda Mines Limited has been assessing a number of gold properties in 1982, and among others, has taken an option on the Fairservice Gold Property in the Bluff Point Lake area, formerly investigated by Selco Incorporated.

A number of exploration projects directed in part at gold has been carried out subsequent to airborne electromagnetic-magnetic surveys over the Manitou-Stormy Lakes and the Atikokan-Mine Centre areas, released in 1981 (Ontario Geological Survey 1981a, 1981b). In the Manitou-Stormy Lakes area, Sulpetro Minerals Limited has carried out ground follow-up, in the form of geophysical surveys and geological work, on at least 5 separate claim groups. Geophysical surveys were carried out for Essex Minerals Company in the Wapageisi and Boyer Lake areas, but this company has subsequently terminated its exploration activities. At least 3 major companies are using the Atikokan-Mine Centre airborne geophysical maps to help direct their exploration projects in that general area, both in a search for gold and for base metals.

The rather spectacular gold occurrence reported on in the 1981 Annual Report of the Regional and Resident Geologists(Blackburn 1982, p.10), which was discovered in 1981 by E. Starr, close to the new Fort Frances-Dryden Highway near Sasakwei Lake, has received further attention in 1982. Starr has done stripping, trenching, and percussion drilling on and in close vicinity to the short, narrow, quartz veins that hosted the gold.

Elsewhere in the Kenora Mining Division, work directed toward gold was carried out as follows: diamond drilling and geophysics at Eagle Lake, in the Buchan Bay area, on and near the Fornieri Occurrence; diamond drilling at Wabigoon Lake, in the Butler Lake area; geophysical surveys in the Lower Manitou Lake area, on the Gaffney Prospect; geological and geochemical work at the Lake of the Woods, in the Echo Bay area, near the old Golden Horn Mine; geochemical work and trenching at Kakagi Lake, in the Heronry and Dogpaw Lakes areas; trenching at Shoal Lake, in the Bad Vermilion Lake area; trenching on an antimony prospect at Manitou Stretch, in the Napanee Lake area; and sampling for assaying in the Aubrey Township area, at the Lone Pine Occurrence.

Base Metals

At least 3 major companies continued their base-metal exploration programs in the Kenora Mining Division in 1982. Noranda Exploration Company Limited carried out geological and geophysical work, and diamond drilling in the English River Subprovince, north of Vermilion Bay, in the Gordon Lake, Squint Lake, Cedar Lake, Cliff Lake, and Clay Lake areas, and in Redvers and Buller Townships. Selco Incorporated also carried out geophysical surveying in the English River Subprovince, in the Squint Lake area. Both of these companies have been carrying out extensive exploration programs for base metals in this high-grade metamorphic terrain, based on its lithologic similarity to the Manitowadge base-metal area, host to Noranda Exploration Company Limited's Geco Mine.

Teck Explorations Limited has diamond drilled electromagnetic conductive zones in Forgie Township, in the northwestern part of the Lake of the Woods. Teck Explorations Limited has been conducting follow-up ground work over the last few years to

SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

TABLE 1

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)	Total Man Days.
1982*	1,430	1,502	4,004	23,187	26,090	5,030	67,027
1981	2,121	846	4,076	26,127	37,624	3,383	72,731.5
1980	1,877	788	3,208	15,428	3,149	859	21,368
1979	984	1,357	2,119	9,992	10,658	1,420	24,182
1978	808	1,357	2,300	22,299	7,576	2,143	34,934
1977	1,495	1,585	2,820	15,405	11,366	1,760	33,838
1976	1,380	2,125	3,234	25,030	21,367	5,960	55,042
1975	1,677	2,452	3,975	23,584	31,509	940	57,266
1974	2,653	1,076	4,727	29,496	18,049	3,070	52,134

* to Nov. 30

TABLE 2 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

-

Open File Reports

OFR 5388
OFR 5371
OFR 5382

Preliminary Maps - Geological Series

P. 2427
P. 2498
P. 2569
P. 2570

Preliminary Maps - Data Series

-

Aggregate Resources Publications

-

Federal - Provincial Maps

-

Coloured Maps

2458

Northern Ontario Engineering Geology Terrain Studies Reports

-

Northern Ontario Engineering Terrain Studies Maps

-

Mineral Resources Branch Publications

-

Miscellaneous Reports

-

Geological Survey of Canada Open File Reports

879

TABLE 3 **EXPLORATION ACTIVITY DURING THE YEAR.**

The following is a list of individuals and companies known to be engaged in exploration within the Kenora Mining Division in 1982 and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figure 1.

Number on Figure	Individual or Company	Activity
1	Aur Resources Inc.	Geophysical survey, Lower Manitou area.
2	Essex Minerals Co.	Geophysical survey, Wapageisi Lake area.
3	Essex Minerals Co.	Geophysical survey, Boyer Lake area.
4	Euro Dollar Development Limited	Diamond drilling, Butler Lake area.
5	Hames, C. Marshall	Diamond drilling, Buchan Bay area.
6	Hansen, Edward	Stripping, Kirkup Township.
7	Hoban, Michael John	Sampling, assays, Aubrey Township.
8	Kroocmo, David and Murray, W.S.	Stripping, Factor Lake area.
9	Lewis, A. J.	Geophysical survey, Halkirk and Watten Townships.
10	McMillen, S.	Trenching, Bad Vermilion Lake area.
11	Martin, Jack	Geochemical, trenching, Heronry Lake area.
12	Martin, Roy A.	Trenching, assaying, Dogpaw Lake area.
13	Noranda Exploration Company Limited	Geological, Gordon Lake area.
14	Noranda Exploration Company Limited	Geological, Redvers Township.
15	Noranda Exploration Company Limited	Geological, geophysical survey, Buller Township.
16	Noranda Exploration Company Limited	Diamond drilling, geophysical survey, Squint Lake area.
17	Noranda Exploration Company Limited	Diamond drilling, geophysical survey, Cedar Lake area.
18	Noranda Exploration Company Limited	Diamond drilling, geophysical survey, Cliff Lake and Clay Lake area.
19	Pearson, E. A.	Diamond drilling, Bennett Lake area.
20	Portalance, R.	Trenching, Napanee Lake area.
21	Redden, J. W.	Stripping, trenching, Tabor Lake area.
22	Sanmine Explorations Inc.	Diamond drilling, Brownridge Township.
23	Selco Inc.	Diamond drilling, Shoal Lake area.
24	Selco Inc.	Geophysical survey, Squint Lake area.
25	Sherritt Gordon Mines Limited	Geological, trenching, stripping, Bad Vermilion Lake area.
26	Starr, Eugene	Stripping and trenching, Turtlepond Lake area.
27	Steeprock Iron Mines Limited	Geophysical survey, Bennett Lake area.
28	Sulpetro Minerals Limited	Geophysical survey, Kawashegamuk Lake area.
29	Sulpetro Minerals Limited	Geophysical survey, Revell Lake area.
30	Sulpetro Minerals Limited	Geophysical survey, Kawashegamuk Lake area.
31	Sulpetro Minerals Limited	Geophysical survey, Boyer Lake area.
32	Sulpetro Minerals Limited	Geological, Wapageisi Lake area.
33	Tanco	Geophysics, Brownridge Township.
34	Tasu Resources Ltd.	Geological, geochemical, Echo Bay area.
35	Tasu Resources Ltd.	Geophysical survey, Buchan Bay area.
36	Teck Explorations Limited	Diamond drilling, Forgie Township.

TABLE 4 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

KENORA MINING DIVISION
SYMBOLS AND ABBREVIATIONS

Assess - Assessment work
Ag - Silver
Au - Gold
BM - Base Metal
Cu - Copper
DD - Diamond Drilling (where shown, the number following "DD" indicate the number of holes drilled and the total length drilled respectively).
Geochem - Geochemical Survey
Geophys - Geophysical Survey
GL - Geological Survey or Report
IP - Induced Polarization Survey
Ni - Nickel
Non Assess - Non Assessment Work Data
Pb - Lead
SA - Sampling, Assays
STr - Stripping
Tr - Trenching
W - Tungsten
Zn - Zinc

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Aubrey Township	52F/14 SE	Hoban, Michael John	Au	Assess	DD 1-65'	1981	-	B-2
	52F/14 SE	Hoban, Michael John	Au	Assess	STr, Tr	1981	-	B-3
Aulneau Peninsula	52E/8 NW	Teck Explorations Ltd.	Au	Assess	Tr, SA	1981	-	C-3
Bad Vermilion Lake	52C/10 NE	McMillen, Stan	Au	Assess	Tr	1982	-	I-2
Bennett Lake	52C/16 SW	Pearson, E.A.	BM, Ag, Au	Assess	DD 1-695'	1982	-	M-4
Bigstone Bay	52E/9 NW	Roberecki, Ed	Au	Assess	DD 1-101'	1981	-	TT-2
Bluffpoint Lake	52F/3 NW	Noranda Exploration Company Limited	Au	Assess	DD 1-121'	1981	-	I-1
	52F/3 NW	Selco Inc.	Au	Assess	Mag, EM	1981	2.4281	H-4
Boyer Lake	52F/7 NE	Starr, Eugene	Au	Assess	STr	1981-82		GG-1
Brownridge Township	52F/15 SE	Sanmine Explorations Inc.	W	Assess	DD 2-876'	1982		R-2
Buchan Bay	52F/11 NE	Hames, C. Marshall	Au, Ag	Assess	DD 5-1,114'	1982	-	Z-1
	52F/11 NE	Hames, C. Marshall	Au, Ag	Assess	Geophys.	1981	2.4127	Z-2
Butler Lake	52F/10 NE	Euro-Dollar Development Limited	Au, Cu, Zn	Assess	DD 15-12,376'	1982	-	K-13
Cedar Lake	52K/3 NE	Noranda Exploration Company Limited	BM	Assess	DD 11-2,880'	1982	-	A-1
Clay Lake	52K/3 SW	Selco Inc.	BM	Assess	DD 2-710'	1981	-	B-1
	52K/3 SW	Selco Inc.	BM	Assess	DD 8-1,956'	1981	-	B-2
Code Township	52E/9 SE	Roberecki, Ed	Au	Assess	Tr	1981	-	Q-1
	52E/9 SE	Zaboroski, Jeff	Au	Assess	STr	1981	-	R-1
Contact Bay	52F/10 NW	Perry, Bruce James	BM, Au, Ag	Assess	STr	1981	-	MM-1
	52F/10 NW	Perry, Bruce James	BM, Au, Ag	Assess	SA	1981	-	MM-2
Dogpaw Lake	52F/5 SW	Martin, Roy A.	Au	Assess	Tr, STr, SA	1982	-	RR-1
	52F/5 SW	Noranda Exploration Company Limited (Martin Option)	Au, Ag	Assess	DD 7-463.6'	1981	-	Z-7
	52F/5 SW	Noranda Exploration Company Limited (Martin Option)	Au, Ag	Assess	SA	1981	2.4406	Z-8
	52F/5 SW	Noranda Exploration Company Limited (Martin Option)	Cu, Zn, Ag, Au	Assess	IP, Mag, EM	1980	2.4075	Z-9
Echo Bay	52E/10 NW	Tibbo, Harold G.	Au, Cu	Assess	GL, Humus and Litho Geochem	1980	2.3687	Y-2
	52E/10 NW	Tibbo, Harold G.	Au, Cu	Assess	Mag, EM	1981	2.4072	Y-3
Ewart Township	52E/11 NE	Martin, Jack D. (Sherritt Option)	Au	Assess	EM	1980-81	2.3970	KK-1
	52E/11 NE	Roberecki, Joel	Au	Assess	STr	1981	-	LL-1
	52E/11 NE	Teck Explorations Limited	BM, Au, Ag, Ni	Assess	DD 1-258'	1981	-	MM-2
	52E/11 NE	Teck Explorations Limited	BM, Au Ag, Ni	Assess	DD 1-258'	1981	-	MM-3
Factor Lake	52C/9 NE	Kroocmo, David and Murray, W.S.	Cu	Assess	STr	1982	-	B-1
	52E/10 NW	Teck Explorations Limited	Cu, Zn, Ni, Ag	Assess	DD 1-268'	1981	-	AA-1
	52E/10 NW	Teck Explorations Limited	Cu, Zn, Ag	Assess	DD 1-218'	1982	-	AA-2
	52E/11 NE	Teck Explorations Limited	BM, Au	Assess	DD 1-264'	1982	-	MM-1

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Halkirk Township	52C/10 NW	Hupchuk, Mike	Au, Ag Cu, Ni	Assess	DD 2-823'	1981	-	B-3
	52C/11 NE	Lewis, Alfred J.	BM	Assess	Geophys. Interpretation	1981	2.4516	MM-1
	52C/11 NE	Phelps-Dodge Corp. Ltd.	Cu, Zn	Non Assess	GL, Geophys.	1963	-	Z-2
Harper Lake	52F/7 NW	Beth Canada Mining Company	Au	Assess	Geophys.	1980-81	2.3825	G-2
	52F/7 NW	Beth Canada Mining Company	Au	Assess	Mag	1980-81	2.3824	G-3
Heronry Lake	52F/4 NW	Martin, Jack D.	Au	Assess	Tr, SA	1982	-	R-1
	52F/4 NW	Teck Explorations Ltd.	BM, Au Ag	Assess	Geochem, EM, Mag	1980-81	2.3821 2.3831	Q-1
Jaffray Township	52E/16 SW	Sherritt Gordon Mines Limited	Au	Assess	EM, Mag	1980-81	2.4099	V-1
	52E/16 SW	Sherritt Gordon Mines Limited	Au	Assess	Mag	1980	2.4315	V-2
Kirkup Township	52E/9 NW	Hansen, Edward	Au	Assess	STr	1982	-	WW-1
	52E/9 NW	President Mines Ltd.	Au	Assess	STr	1980	-	SS-9
	52E/9 NW	President Mines Ltd.	Au	Assess	GL	1981	-	SS-10
	52E/9 NW	President Mines Ltd.	Au	Assess	GL	1980	-	SS-11
	52E/9 NW	Zebruck, George	Au	Assess	STr	1982	-	XX-1
Little Turtle Lake	52C/15 SE	Lafreniere, A.E. (Sherritt Option)	BM	Assess	STr	1981	-	W-1
	52C/15 SE	McMillen, Robert L.	Au	Assess	STr, Tr	1981	-	T-2
	52C/15 SE	Pitkanen, Thomas	Au	Assess	STr, Tr	1981	-	S-3
MacQuarrie Township	52E/8 NE	Teck Explorations Limited	BM, Au, Ag	Assess	DD 1-192.8'	1981	-	J-2
Manross Township	52E/9 SW	Teck Explorations Limited	BM, Au,	Assess	DD 1-60.4'	1981	-	P-2
Melgund Township	52F/9 SW	Glatz, Alexander	Au	Assess	STr	1981	-	AA-1
Napanee Lake	52F/3 NE	Portelance, Robert	Au	Assess	Tr, STr	1982	-	I-2
Reed Lake	52C/16 SW	Redden, J.W.	Au	Assess	STr	1981	-	Q-1
Rowan Lake	52F/5 SE	Sherritt Gordon Mines Limited (Petrunka Option)	Au, Ag, Fe	Assess	Mag, EM, SA	1981	2.4226	KK-1
	52F/5 SE	Nuinsco Resources Limited	Au, Ag	Assess	DD 19-5,687.0'	1981	-	JJ-2
Shoal Lake	52E/10 SW	Tibbo, Harold G.	Au	Assess	Mag, EM	1981	2.4104	GG-2
Snowshoe Bay	52E/11 SE	Selco Inc.	Au, Cu, Zn	Assess	DD 1-400'	1982	-	O-1
Squint Lake	52K/3 SE	Noranda Exploration Company Limited	BM	Assess	DD 1-173 m	1982	-	B-1
	52K/3 SE	Selco Inc.	BM	Assess	DD 1-260'	1981	-	A-1
	52K/3 SE	Selco Inc.	BM	Assess	DD 1-282'	1981	-	A-2
Tabor Lake	52F/9 SW	Redden, J.W.	Au, Ag, Pb, Zn	Assess	GL, STr	1979-81 1982	2.4250	X-5
	52F/9 SW	Redden, J.W.	Au	Assess	STr	1982	-	X-6
Tabor Lake	52F/9 SW	Corporation Falconbridge Copper	Au	Assess	Mag, EM	1980	2.3866	BB-1
	52F/9 SW	Sulpetro Minerals Limited	Au	Assess	SA, GL	1981	-	CC-1
	52F/9 SW	Sulpetro Minerals Limited	Au, Ag	Assess	GL	1979-81	2.4369	CC-2
Zealand Township	52/15 SE	Sanmine Exploration Inc.	W	Assess	Tr	1981	-	R-1

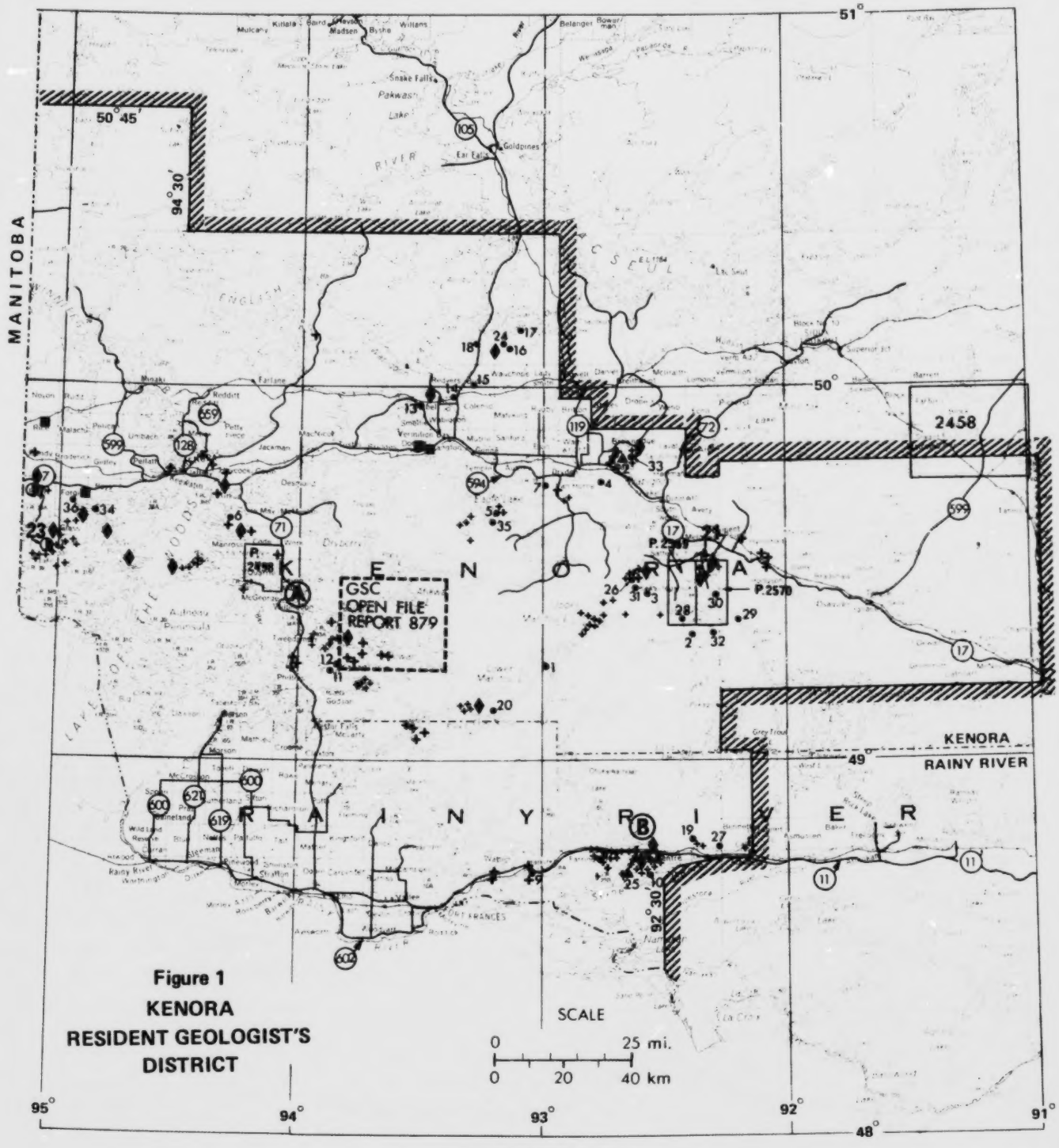

Figure 1
KENORA
RESIDENT GEOLOGIST'S
DISTRICT

EXPLANATION

- • Exploration activities in 1982 (keyed to Table 3)
- ◑ Mines and/or properties under development (Keyed to Table 3)
- Ⓐ Location of OGS Field Party and/or Special Project in 1982
- ▲ Properties under evaluation and/or exploration in 1982 (keyed to Table 3)
- ■ Producing Quarries
- ♦ Property Visits
- Map or Report issued by the Ontario Geological Survey in 1982 (keyed to Table 2)
  - P. – Preliminary Map
  - 2458 – Coloured Map
  - OFR – Open File Report
- Boundary of Resident Geologist's District

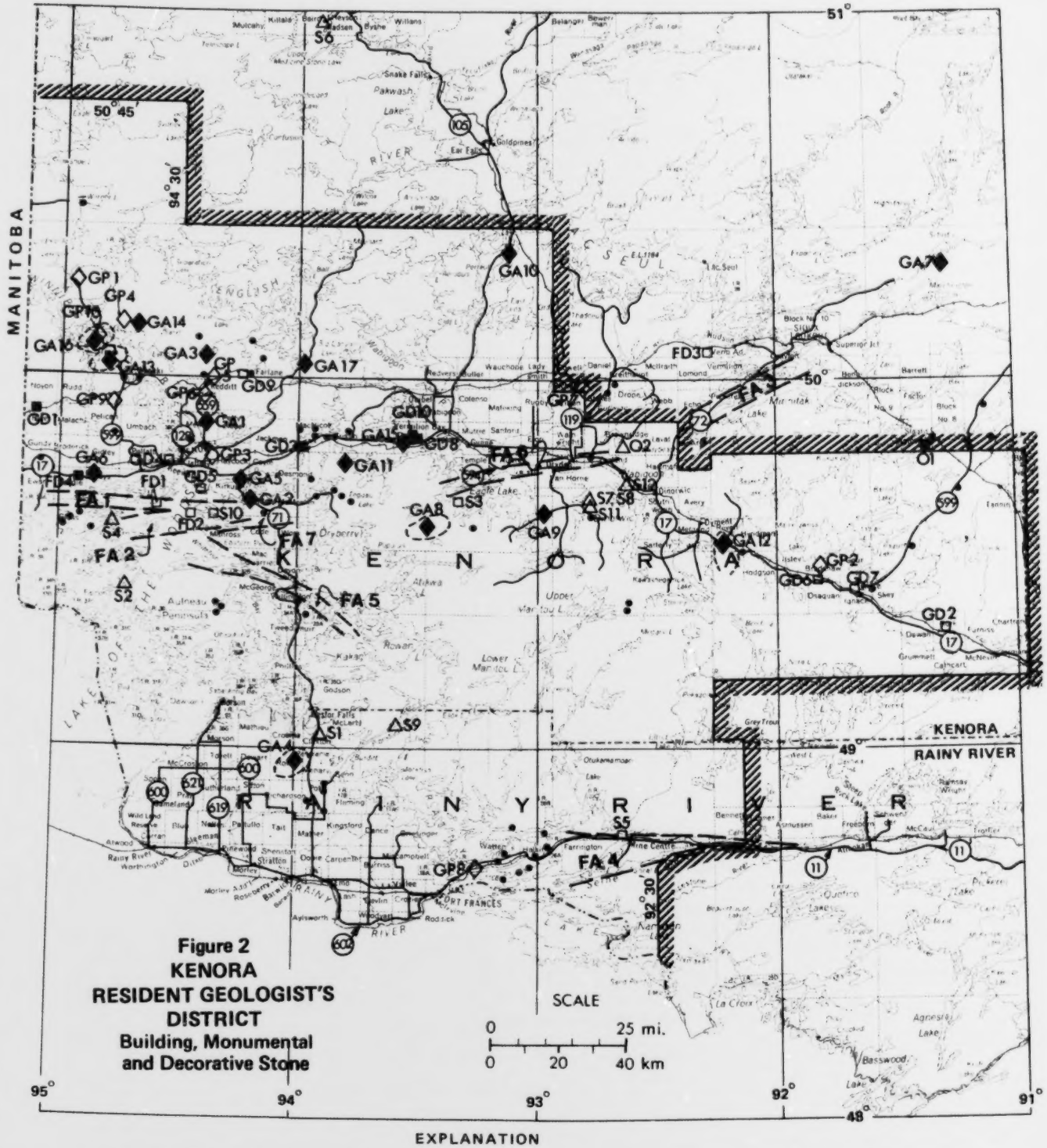

Figure 2
KENORA
RESIDENT GEOLOGIST'S
DISTRICT
Building, Monumental and Decorative Stone

EXPLANATION

- Producing Quarries (all commodities)
- Past Producing Quarries (all commodities)
- Granite Prospects and Granitoid crushed stone
- Granite study areas
- Outline of granite study area
- Granite sample location (outside of study areas)
- Flagstone areas
- Soapstone and other commodity occurrences and prospects
- GD1, S2, GP1 — Deposit number (keyed to Table 5)

an airborne electromagnetic-magnetic survey flown over the general Lake of the Woods through Kakagi Lake area.

Euro-dollar Development Limited continued their exploration at Wabigoon Lake, with diamond drilling in the Butler Lake area. A considerable amount of geophysical, lake sediment geochemical, diamond drilling, and assay work has been done by this company over the last few years.

Other companies engaged in base-metal exploration in 1982, in some cases combined with gold exploration included; Essex Minerals Company, Mattagami Lake Exploration (now combined with Noranda Exploration Company Limited), and Steeprock Iron Mines Limited.

Other Minerals

The Tantalum Mining Corporation of Canada has optioned the tantalum-lithium pegmatite property in Brownridge Township, near Mavis Lake. Selco Incorporated had carried out exploration since 1978, dropping the option early in 1982. The work of The Tantalum Mining Corporation of Canada to date consists of a geophysical survey, and under an OMEP agreement, geochemical, and magnetic surveys.

Sanmine Explorations Incorporated has been investigating the scheelite occurrence, also near to Mavis Lake, in Zealand and Brownridge Townships. Trenching has been concentrated along and close to a west-northwesterly trending base line that extends across 8 claims. Diamond drilling, using HQ core, indicates that scheelite has been detected by ultraviolet lamping in narrow 1 inch to 10 inch intersections, commonly associated with quartz-tactite bands, in a hornblende schist.

Property Examinations

In 1982, the following mining and exploration properties, and mineral occurrences and prospects were examined by the Kenora staff as part of the regular program:

Ambrose Prospect (Gull Island) — Wiley Bay Area.

Brockman, M., HW 419 Occurrence — Tabor Lake area.

Cameron Island Mine (Duport Mine) — Snowshoe Bay area.

Caswell-Williams Prospect — Dogpaw Lake area.

Echo Bay Occurrence — Echo Bay area.

Edwards-Fairservice Prospect — Bluffpoint Lake area.

Flint Lake Occurrence — Dogpaw Lake area.

Foley Mine — Bad Vermilion Lake area.

Gauthier (Dogpaw Lake) Occurrence — Dogpaw Lake area.

Golden Star Mine — Bad Vermilion Lake area.

Green Gold Location — Little Turtle Lake area.

Isabella Prospect — Bad Vermilion Lake area.

Manhatten Prospect — Bad Vermilion Lake area.

McLennan Occurrence — Dogpaw Lake area.

Nonesuch Prospect — Echo Bay area.

Sakoose Mine — Tabor Lake area.

Sewell, E., Occurrence — Dogpaw Lake area.

Sovereign Peak Lake Occurrence, K624 — Turtlepond Lake area.

Starr, E. Occurrence — Boyer Lake area.

Wendigo Mine — Manross Township.

Asbestos:

Oak Bay Asbestos Occurrence — Wiley Bay area.

Labyrinth Bay Asbestos Occurrence — Shoal Lake area.

Molybdenum:

Evenlode Molybdenite Mine — Indian Bay area.

Tungsten:

Zealand — Brownridge Tungsten Prospect — Zealand and Brownridge Townships.

Base Metals:

Noranda Exploration Company Limited — Cliff Lake, Cedar Lake, Clay Lake, Squint Lake areas, and Redvers and Buller Townships.

Information on these properties is on file at the Kenora Resident Geologist's office.

The following recommendations are in part made as a result of a number of these property examinations.

Recommendations for Prospecting and Exploration

Base Metals in the English River Subprovince

The English River Subprovince has been relatively unexplored for base-metal potential in the past. Because of the obvious association of base metals with volcanic environments within the Kenora Mining Division, the Wabigoon Subprovince has been extensively explored, even up to the recent past (Teck Explorations Limited, Euro-Dollar Development, Essex Minerals Company, Mattagami Lake Explorations, and Steeprock Iron Mines Limited: this report).

Helicopter-supported geological survey of much of the English River Subprovince carried out by the Ontario Geological Survey from 1973 to 1977 (Breaks *et al.* 1978) generally supported the commonly held belief that within the Kenora Mining Division this subprovince contains only a low proportion of volcanic rocks. Most of these were mapped as rather isolated units, characteristically in the Separation Lake area,

but also scattered throughout the southern part of the subprovince. This area is interpreted as a Southern Plutonic Domain, in contrast to a Northern Supracrustal Domain by Breaks *et al.* (1978).

As a further result of this mapping, a rather unique suite of felsic to intermediate gneissic rocks, variously called the Gneissic Granitoid Suite or Gneissic Plutonic Suite (Breaks *et al.* 1978) was outlined. Complexity and variability in composition and fabric of this suite posed the problem of their genesis. Breaks *et al.* (1978, p.25) interpreted this suite to be "a migmatitic intrusive complex", in which "many of the component phases have been introduced from an external source". Eight mappable components were recognized, following detailed work by Westerman (1978) in the Clay Lake-Cedar Lake area, varying in composition from mafic (amphibolite) to felsic (leucotrondhjemite), though dominant components seem to be intermediate to felsic. The more mafic rocks, including amphibolites and mafic hornblende-biotite gneisses, were ascribed to a number of origins (Breaks *et al.* 1978, p.28) namely: "metamorphic transposition of mafic minerals within a parent igneous intrusive; inclusions from an earlier supracrustal sequence; early mafic dikes; igneous differentiation or partial melting of rocks of basaltic composition. All other phases were considered to be of plutonic origin".

Conversely, if members of this suite are considered to be of volcanic rather than plutonic origin, the area outlined as felsic to intermediate gneissic rocks becomes a very favourable one for base-metal exploration. This geological concept has been developed both by Noranda Exploration Company Limited and Selco Incorporated, who have well-established and extensive exploration programs in a large area straddling Highway 105 north of Vermilion Bay. Assessment work submitted to date by both companies documents that massive sulphide conductors, and minor amounts of chalcopyrite have been picked up in diamond-drill core.

Gold Deposits in the Kakagi-Rowan Lakes Area

Considerable interest in gold deposits on and near the northwest-trending Pipestone-Cameron Fault zone has developed in particular, this interest is close to Flint Lake, Cedartree Lake, and Emm Bay of Kakagi Lake southwest of the fault, and at Cameron Lake and Sullivan Bay of Rowan Lake northeast of the fault, but offset some 10 km to the southeast along the fault. In this area emphasis has traditionally been laid on the fault zone and subsidiary shears in the search for gold. Davies and Morin (1976, p.22) suggested that "shear zones associated with the major fault zone extending through Dogpaw Lake to Stephen Lake seems especially favourable for the occurrence of gold mineralization". Similarly, but with a slight change in emphasis, Beard and Garratt (1976, p.5), suggested that "Sericite and carbonate-bearing shear zones may actually represent sheared volcanic tuffs which contained syngenetic gold mineralization remobilized into favourable structures". These authors go on to suggest the Pipestone-Cameron linear to be such a shear zone. It is of particular note that while gold mineralization is known in the 2 areas on either side of the fault mentioned above, no occurrences are documented along the fault between these 2 areas.

Regional geologic synopsis of a much larger region, but encompassing the Kakagi-Rowan Lake area (Trowell *et al.* 1980), has led to the suggestion (p.6) that:

1) At Kakagi Lake a lower tholeiitic, mafic, volcanic flow sequence (Snake Bay Volcanics) is overlain by an upper calc-alkaline mixed mafic to felsic, predominantly pyroclastic sequence (Kakagi Lake Volcanics), and the transition between these two sequences lies between Flint Lake and Emm Bay of Kakagi Lake;

2) At Rowan Lake a lower, tholeiitic, mafic, volcanic flow sequence is similarly overlain by an upper calc-alkaline, mixed mafic to felsic, predominantly pyroclastic sequence, and the transition between these two sequences lies between Cameron Lake and Sullivan Bay of Rowan Lake.

The areas currently receiving exploration attention for gold are therefore seen to occur at or near the transition from a lower tholeiitic mafic flow sequence into an upper calc-alkaline, mixed, predominantly pyroclastic sequence, but offset one from the other some 10 km along the Pipestone-Cameron Fault. Southwest of the major fault, occurrences that are situated at or near this transition include: the Caswell-Williams Prospect; the Sewell, E. Occurrence; the Dogpaw Lake (Consolidated Golden Arrow) Prospect; the McLennan Occurrence; the Cameron-Carmichael Occurrence; the Martin-Kenty Occurrence; the Gold Sun Prospect; the Jessie Lake Occurrence; the McIntyre Occurrence; and the Wright, M.P. Occurrence. Northeast of the fault, occurrences that are situated at or near this transition include: the Noranda-Beggs Lake Prospect; the Meston Occurrence; the Sullivan Prospect; the Kuryliw-Sullivan Bay Occurrence; the Monte Cristo Prospect; the Errington Prospect; and the Wampum Lake Prospect.

Descriptions of these deposits from various sources, summarized by Beard and Garratt (1976), suggest that occurrence of gold is predominantly in quartz veins either in shear zones in the volcanic country rock, or in fractures in porphyry dikes. Only at the Caswell-Williams Prospect and the Noranda-Beggs Lake Prospect has the suggestion been made that felsic tuffs, more or less sheared, are the host rocks, and that the gold may be syngenetic. The suggestion is made here that many of the other occurrences may have been derived by secondary processes (metamorphism, hydrothermal activity) from syngenetic source rocks at or near the transition from mafic tholeiitic to calc-alkaline, more felsic, volcanism, subsequent to or possibly during initial deformation of the volcanic pile. Whatever mechanism pertained, thorough exploration should be carried out along this transition zone, on either side of the Pipestone-Cameron Fault.

Gold Association of the Wendigo Mine Area

Among the numerous gold occurrences of the general Bigstone Bay-Andrew Bay area on the eastern side of the Lake of the Woods, the Wendigo Mine, between Witch Bay and Lac La Belle has aroused considerable recent interest, both in terms of its potential for further gold in subsurface (Denison Mines Limited: this report) and for the potential of obtaining gold from the tailings (Porta Metal Mills: 1981 Report of the Kenora Resident Geologist, Blackburn (1982)).

The Wendigo Mine was the largest gold producer in the Lake of the Woods. In the period 1900 to 1951, 67 423 ounces of gold and 14 762 ounces of silver were obtained from 206 054 tons of ore milled; 1 886 246 pounds of copper were also produced (Beard and Garratt 1976). Ore was supposedly exhausted in 1943. The geological environment, both lithological and structural, however, suggests that there is excellent potential for both precious and base metals in the general Wendigo Mine area.

Mapping by Suffel at a scale of 1 inch to 1 mile (1931) and Thomson at a scale of 1 inch to 20 chains (1936) indicated that mafic volcanic rocks were extensively intruded by mafic rocks, identified as diorite by these workers. Subsequent more detailed mapping at a scale of 1 inch to 200 feet in the immediate vicinity of the Wendigo Mine by Brownell (1941), enabled subdivision of the mafic intrusive rocks into 3 units, lamprophyre, gabbro, and diorite. Thomson (1936) and Brownell (1941) showed the ore zone at the Wendigo Mine to lie within the mafic lavas, and while extensive talc alteration of the mafic intrusive rocks was noted by Brownell (1941) to be indicative of regional, possibly hydrothermal alteration, no other significance was attached to these rocks in the genesis of the ore deposit.

Recent work by Denison Mines Limited geologists (G. Patterson, N. Kazira, Geologists, Denison Mines Limited, personal communications, 1982) has led to the re-interpretation of lamprophyre, gabbro, and diorite units as peridotite, hornblendite, and leucogabbro respectively, with the conclusion that these are members of a differentiated body or bodies from peridotite base to leucogabbro top. Using this model, numerous fold axes can be identified on Brownell's (1941) map. A unit of feldspar-phyric basaltic lavas, mapped by both Thomson (1936) and Brownell (1941), occurs immediately below and in sharp contact with the base of the differentiated bodies. This leads to the suggestion that the differentiated ultramafic to mafic bodies may be very thick flows rather than sills.

Sections through the Wendigo Mine workings (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora) show the Number 1 vein, developed to the 1700-foot level, to lie parallel to and about 200 feet below the mafic lava-peridotite contact, which dips steeply to the north. This lends support to the interpretation of Brownell (1941) that the ore zone is stratabound. The Number 2, Number 3, and Number 4 veins, though occurring within the mafic lavas, are at different levels, the Number 2 vein being in the feldspar-phyric lava immediately below the differentiated unit. In 1941, a "new vein" which assayed 0.22 ounce across 7 feet was intersected in a 1000-foot long exploratory drillhole to the north from the 1700-foot level. This hole passed through a major synclinal axis in the differentiated unit, and intersected the "new vein" within mafic lavas at what may be interpreted to be a similar stratigraphic level to the Number 1 vein.

There is, thus, some evidence that gold mineralization at and near the Wendigo Mine may be stratabound and at a specific level in the stratigraphy, namely, just below the differentiated ultramafic to mafic sill or flow. This concept could be extended both west and east of the Wendigo Mine, to Andrew Bay and towards Gibi Lake respectively. Only part of the area west of the Wendigo Mine has been mapped in detail (Davies 1967), but the mapping of Suffel (1931) shows extensive areas of possible differentiated ultramafic to mafic rocks. Eastward, Trowell, Logothetis, and Caldwell (1980) noted pyroxenites and layered ultramafic to mafic bodies close to Highway 71 at about the same stratigraphic level as those at the Wendigo Mine. Not only is this an excellent exploration and prospecting area for gold, but also for base metals.

Tungsten Potential of the Dryden Area

The occurrence of scheelite near to the Zealand-Brownridge Townships boundary line, some 10 km east-northeast of Dryden has been known since at least the late 1960s, when D. Petrunka brought it to the attention of Noranda Mines Limited. Selected samples were reported (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora) to run 0.25% WO_3, and channel samples ran 0.1% and lower. Interest in the deposit has fluctuated since, the most recent exploration being presently undertaken by Sanmine Exploration Incorporated.

Geological mapping by Satterly (1943) indicates that rocks in the vicinity of the scheelite occurrence in concessions 7 and 8 of Zealand Township and the adjoining area around Mavis Lake in Brownridge Township, are predominantly amphibolites derived from mafic volcanics on the north, and quartz-feldspar-biotite schists derived from greywackes on the south. Both of these supracrustal lithologies have been intruded by granitic rocks of the Ghost Lake Stock that lies to the west, and a smaller granitoid stock in lots 16 through 19, concession 7, Zealand Township.

The scheelite appears to be concentrated in the amphibolites rather than the metasedimentary schists. The amphibolites are well exposed in an east-trending ridge, whereas the metasediments are only poorly exposed near their contact with the amphibo-

lites. The occurrence has the characteristics of a skarn, or metamorphic replacement zone. Scheelite is documented (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora) along a zone within the amphibolites, parallel to the contact, at scattered localities for a distance of almost 2000 m, and may well be more extensive.

With the aid of an ultraviolet lamp, observation of trenches on the occurrence that have recently been further opened up by Sanmine Exploration Incorporated, show the scheelite to occur both with amphibolite country rock and in whitish lenticular zones of silicification and veining characterized by diopside and epidote as the predominant mineral phases, with accessory carbonate and quartz. The veins are predominantly concordant with the superimposed foliation in the amphibolites, and are commonly margined by actinolite and tourmaline. Scheelite is not ubiquitous in these veins, though highest concentrations appear to be in them rather than the amphibolite. Later cross-cutting pegmatoid and granitic veins that commonly contain tourmaline, do not contain detectable scheelite. Scheelite has not been reported from any of the surrounding granitoid rocks, though it is unlikely that they have been entirely examined by ultraviolet lamp. Neither has it been reported in complex pegmatites that occur south and east of Mavis Lake.

Recent exploration (Selco Incorporated, The Tantalum Mining Corporation of Canada), mapping, and research by the Ontario Geological Survey (Breaks *et al.* 1978; Breaks 1980), and research by universities (Ucakuwun 1981) has been directed at the complex pegmatites and associated lithophile elements, with little to no emphasis on tungsten. Observations at the Zealand-Brownridge Occurrence suggest that there may be an association with late-stage, pneumatolytic, fluids generated during diatexitic melting of pre-existing sediments that produced the Ghost Lake Stock, but that the formation of scheelite predates the latest, highly fluidal, pegmatite-forming liquids.

It is suggested that further scheelite occurrences should be sought marginal to the Ghost Lake Stock, probably within amphibolitized mafic volcanic rocks, especially where these have been injected by pegmatites. Calc-silicate minerals, typical of skarn zones, may best be developed in these mafic metavolcanics, but the possibility of the association with calc-silicates developed in metasediments should not be overlooked. In this regard, Pettijohn (1940) noted the presence of calcareous lenses and beds within Thunder Lake sediments at low metamorphic grade, while Gorzynski (1978) noted similar features, but at higher metamorphic grade, within the same sequence.

Building, Monumental, and Decorative Stone

This project was undertaken to encourage further development of the building stone, monumental stone, and decorative stone industry in northwestern Ontario. It began in April 1982, with a literature survey of known building stone deposits and other industrial mineral commodities including a survey of references in the literature to potential building stone and industrial mineral deposits such as massive granitoid rocks, slatey rocks, and soapstone. This survey was followed by field work.

Terminology in use in the stone industry is not the same as that used in geological literature. The major commodities are: granite which includes all felsic and mafic crystalline igneous rocks; marble which includes any carbonate rock that polishes (regardless of metamorphic grade), serpentinite, travertine and onyx; flagstone and slate which includes true slates as well as foliated rocks of varying lithology but which can be easily split into thin slabs; soapstone which is any soft talc rock that can be carved; trap rock which is any dark coloured non-granitoid rock (such as metabasalt, diabase, etc.) which is crushed for track ballast, road building, etc.; and decorative stone which includes any rock that could be made into small decorative objects. In addition, consideration is being given to material that could be crushed and used as decorative aggregate for the face mix of precast concrete panels. Most of the emphasis of the project is on granite because it is the most valuable of the commodities that can be produced on a large scale.

Six deposits are currently in production in the area. The Hawk Lake, Watcomb, and White Quarries produce railway track ballast on an intermittent basis. Material is crushed for several months and is used as needed from the stockpile. The Hawk Lake and White Quarries are in granitoid rocks; the Watcomb Quarry produces traprock. The Nelson Granite Division of Nelson Monuments Limited and Universal Granite Centre (1976) Limited produce pink granite for monuments. Rush Bay Quarries produces a well foliated metavolcanic for building facing and flagstone. In addition to these 6, there are several past producers of granite for building, monument, and crushed stone and of slate for roofing and flagstone. Figure 2 shows the locations of all these deposits.

Field work consisted of examining the known producers, past producers and prospects, and potential stone deposits (granitoid, gabbroic, slaty, soapstone, decorative stone) discovered during the literature survey. Much of the data gained from the literature survey was difficult to interpret, particularly in the case of granite due to inconsistencies in the description of granitoid rocks between various authors. Areas of potential stone deposits that initially looked promising were mapped at a reconnaissance scale and samples were taken for polishing and petrographic work. Large areas of granitoid rocks are almost devoid of detailed geological mapping. Evaluation of these areas was carried out by reconnaissance surveys along roads and followed up with mapping of areas of granitoid, gabbroic or slatey rocks that appeared to warrant further investigation.

TABLE 5 | BUILDING AND MONUMENTAL STONE DEPOSITS [1]

Granite Study Areas

GA 1 Austin Lake (Gneiss)
GA 2 Blindfold Lake
GA 3 Forgotton Lake
GA 4 404 Road
GA 5 Junction Granite
GA 6 Granite Lake
GA 7 Marchington River
GA 8 Mulcahy Lake Stock
GA 9 Nabish Lake
GA 10 Perrault Falls
GA 11 Pine Road
GA 12 Revell Batholith
GA 13 Roughrock Lake/Cygnet Lake
GA 14 Sand Lake Road
GA 15 Vermilion Bay Gneiss
GA 16 Whitedog
GA 17 Keys Lake

Granite Deposits (producers and past producers)

GD 1 CNR White - ballast
GD 2 CPR Bonheur - ballast
GD 3 CPR Hawk Lake - ballast
GD 4 CPR Keewatin - dimension stone (bridge piers, etc.)
GD 5 CPR Quarry Island - dimension stone (bridge piers, etc.)
GD 6 Horne Granite Quarry - dimension and monumental
GD 7 Horne and Bannerman Quarry - dimension stone, paving stone
GD 8 Nelson Granite - monumental stone
GD 9 Ontario Granite Company - Farlane Quarry - monumental stone
GD 10 Universal Granite Centre(1976) Ltd. - monumental stone

Granite Prospects and Crushed Granite

GP 1 Caribou Falls - concrete aggregate
GP 2 Gummeson Prospect - dimension stone
GP 3 Jones Road - crushed stone (producer)
GP 4 MTC, Sand Lake Road - crushed stone
GP 5 Norlicka Minerals Prospect - dimension stone
GP 6 Redditt - crushed stone
GP 7 Richan Prospect - ballast
GP 8 Rocky Inlet - rock fill and crushed stone
GP 9 Wade - aggregate
GP 10 Whitedog - concrete aggregate

Soapstone Deposits

S 1 Claxton Township - occurrence
S 2 Coste Island - prospect
S 3 Eagle Lake Soapstone Quarry - past producer
S 4 Labyrinth Bay - occurrence
S 5 Little Turtle Lake - past producer
S 6 Madsen - occurrence
S 7 Mile Lake #1 - prospect
S 8 Mile Lake #2 - occurrence
S 9 Pipestone Lake - occurrence
S 10 Pipestone Peninsula - past producer
S 11 Trap Lake - prospect
S 12 Wabigoon - prospect

Flagstone Deposits

FD 1 Fox Island - past producer
FD 2 Gibbons Slate Quarry - past producer
FD 3 Hudson - prospect
FD 4 Rush Bay Quarries - producer

Flagstone Areas

FA 1 Crowduck Rush Bay lineament
FA 2 Lake of the Woods
FA 3 Minnitaki Lake - Vermilion Lake area
FA 4 Quetico Fault
FA 5 Sioux Narrows
FA 6 Wabigoon Fault
FA 7 Witch Bay
FA 8 Yellow Girl Bay

Other Rock Types

O 1 Watcomb Quarry - trap rock for ballast
O 2 Mavis Lake - pegmatites
Carbonate veins)
Quartz veins) not plotted
Metavolcanics)

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[1] Locations are keyed to Fig. 2

Personnel hired under the Mining Sector Work Program carried out field reconnaissance and sampling and prepared polished samples. Investigations took place in the Kenora and Ignace areas where the field personnel examined roadsides, some railway lines and lakeshores, and took numerous samples. This work delineated areas that required follow-up examinations.

The most promising granite deposits found to date are in the English River Subprovince. These consist of late stage granite, quartz monzonite, and granodiorite bodies which often form rounded masses, particularly in the southern part of the subprovince. The English River Subprovince contains several pink to pink-red coloured bodies, as well as numerous grey, and a few brown coloured granitoids. The so-called black 'granite' deposits are not nearly as numerous. The best examples are the Mulcahy Lake Intrusion and the Bad Vermilion and Grassy Portage Intrusions. These contain gabbroic anorthosite phases which may be uniform enough to be quarried. Many of the gabbroic bodies examined contain sulphide mineralization, extensive alteration, or are extensively fractured. The most promising of these deposits are located away from major fault or fold systems and are late stage intrusions.

Areas of highly schistose rocks are commonly associated with the many major and minor fault systems in the area. The deposits that have potential were initially fine-grained rocks, usually felsic metavolcanics or fine-grained metasediments. True slate has been quarried from deposits in the Lake of the Woods area in the past, and numerous examples of slatey cleavage, developed in folded metasediments and metavolcanics, are present in the northern part of Lake of the Woods. True slates are fine-grained metasediments; deposits of sub-economic size have been located in several places.

Small soapstone deposits have been developed near Dryden and Mine Centre but no significant recent production or exploration work has taken place since the 1920s. The potential of these deposits is more for use as artistic carving material than industrial production. New soapstone deposits have not been discovered as yet, although talc zones associated with the Red Lake Gold Deposits indicate that soapstone probably exists in many mineralized areas. Small altered ultramafic intrusions in several places indicate that additional soapstone deposits may be present.

With respect to marbles only the Verde Antique serpentinite type Deposits and small carbonate veins and carbonate-bearing sedimentary rocks are present in the area. The serpentinites have not been completely evaluated, particularly with respect to weathering resistance. The carbonate deposits are all quite small but may have potential for the production of small decorative objects.

A market study of the northwestern Ontario stone industry is to be completed by March 31, 1983. Publication of this report is planned later in that year, and is to be undertaken by Les Consultants Sogir Incorporated. Please note that the Ontario Geological Survey does not guarantee publication of this report in 1983. The objective of the study is the identification of development opportunities and markets for natural stone present in northwestern Ontario. This study will assist the industry in determining the type of commodities to produce, and the sector of the market that could be served. In addition, it will assist both government and industry in the planning of such development.

Heap Leach Demonstration Project

As reported (Beard and Rivett 1981; and Blackburn 1982), a gold heap leaching test program is being carried out by the Ontario Ministry of Natural Resources to assess and demonstrate the feasibility of using this low-cost gold recovery technique in northern Ontario.

Bench test work carried out in 1980 and reported by Witte (1981) indicated that some Early Precambrian (Archean) gold ores from northwestern Ontario are amenable to heap leaching.

Funds are now being provided through the Northern Ontario Rural Development Agreement (NORDA) to assist the private sector in carrying out 1 test demonstration project in the field.

Lenora Exploration Limited has been selected to receive technical assistance under this one-time-only program. Technical assistance will be provided by the Ministry through a consultant, Witteck Development Incorporated, for one 10 000 ton test heap, which will be leached on the company's property in the Larder Lake area.

The Ministry's consultant will provide technical assistance with the design, construction, and monitoring of the project. The company will provide the gold ore, the leaching site, and will be responsible for carrying out the project.

This simple, low-cost gold recovery process has been used extensively in the United States and elsewhere in the world for a number of years, but this will be the first production-scale gold heap leaching project in Canada.

There are a great number of small deposits identified throughout Northern Ontario which appear to be too small to warrant the high capital costs of conventional mill construction. If the heap leaching process can be demonstrated to be feasible in Northern Ontario, it will offer a simple, low-cost method to develop many of these small deposits.

Ontario Geological Survey Activities

During the 1982 field season, the following field parties from the Precambrian Geology and Mineral Deposits Sections of the Ontario Geological Survey operated within the Kenora Mining Division.

G.W. Johns (Precambrian Section) continued a detailed geological mapping program commenced in the MacQuarrie-McGeorge Townships area (Johns 1981) encompassing the southern margin of the Dryberry Batholith and volcanics in the area of Berry Lake, approximately 30 km southeast of Kenora (Johns 1982; Figure 1, A).

K.H. Poulsen (Mineral Deposits Section) was completing his comprehensive study of the geological environment for base-metal and gold mineralization in the Mine Centre-Fort Frances area (Figure 1, B).

Ontario Mineral Exploration Program (OMEP)

During 1982 and as of November 30, 1982, 11 designated OMEP programs were operative in the Kenora Mining Division.

These include: for gold exploration, Ciglen Investment Limited in Bad Vermilion Lake area; Chester Kuryliw in the Tabor Lake area, and Melgund Township; Lynx Canada Exploration Limited in Hyndman Township; Jack D. Martin in the Dogpaw Lake and Heronry Lake areas; Arnold Mickleson in the Shoal Lake area; R. Pitkanen in the Little Turtle Lake area; Pat Sheridan in the Turtlepond Lake and Boyer Lake areas; Sherritt Gordon Mines Limited in the Lawrence Lake area; Tarbush Lode Mining in Laval and McAree Townships.

In addition: for tantalum, Tanco in Zealand Township; and for tungsten, Sanmine Explorations Incorporated in Zealand Township.

Research by Other Agencies

Atomic Energy of Canada Limited

In connection with the Canadian Nuclear Fuel Waste Management Program, 2 studies have been released in 1982 pertaining to the Overflow Bay Gabbro, Atikwa Lake area. These are a terrain assessment of the Overflow Bay vicinity commissioned by Atomic Energy of Canada Limited, that included 2 other potential research areas elsewhere in Northern Ontario (Leech and Copper 1982), and a high resolution aeromagnetic survey over the larger Caviar Lake area (Figure 1), that includes the Overflow Bay Gabbro (Geological Survey of Canada 1982), flown by the Geological Survey of Canada experimental aeromagnetic gradiometer system in 1981. The latter Open File Report (Geological Survey of Canada 1982) also includes a similar survey flown over a pluton in northeastern Ontario.

University Theses

Geological theses related to the Kenora Mining Division believed to be in progress or completed during 1982, are as follows:

B.Sc.

Dankoff, John: "Petrographic Section at Duport Mine, Shoal Lake Area, Northwestern Ontario" (University of Manitoba).

M.Sc.

Kresz, D.V.: Continued a study on volcanism and related mineral deposits in the Kawashegamuk Lake area (Brock University).

Stix, John: Commenced a study at Andrew Bay, Lake of the Woods sampling the transition from lower, tholeiitic volcanics through to upper, calc-alkaline volcanics (University of Toronto).

Ph.D.

Poulsen, K.H.: Continued a study of the geological setting of mineralization in the Mine Centre-Fort Frances area (Queen's University).

Other Research

John Hennessy, post-doctoral fellow working with professor E. Spooner at the University of Toronto, and studying lithophile mineralization in the Superior Province, included field study of the tantalum and tungsten associations in the Dryden vicinity.

Murray Duke, of the Geological Survey of Canada, as a part of his ongoing study of chromite and platinoid group elements in layered mafic intrusions, paid a brief visit to the Mulcahy Lake mafic intrusion.

Professor H. Halls, Erindale College, University of Toronto, studied and sampled Proterozoic diabase dikes on the Lake of the Woods as part of an ongoing study of their paleomagnetism and mechanism of emplacement.

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1982 Report of the Red Lake Resident Geologist

M.E. Durocher[1]

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Introduction

The Red Lake Resident Geologist's Office is presently staffed by M. Durocher, Resident Geologist, and C.D. Van Leeuwen, Secretary. S. van Haaften was Resource Geologist from January to August. One geological assistant was employed for 16 weeks during the summer.

Resident Geologist's Activities

As in previous years, a technical advisory service was provided to companies and individuals engaged in mineral exploration within the Red Lake Mining Division. The number of visitors utilizing these available services and facilities amounted to 900 during the past year.

Selected mineral properties in the Red Lake, Uchi-Confederation, North Spirit, and Setting Net Lake Metavolcanic Belts were visited by the staff.

The Resident Geologist undertook a 3-year study of the geology and distribution of gold deposits in the Red Lake Belt. This study is in progress, and a study of the hydrothermal alteration associated with the Madsen and Starratt-Olsen former gold producers was initiated.

The Resident Geologist, H. Wallace of the Ontario Geological Survey, and J. Pirie of Esso Minerals Canada jointly led 2 Geological Association of Canada field trips, and 1 Ontario Geological Survey field trip in the Red Lake Belt. The Resident Geologist also led several field trips for industry geologists, and student groups in the Red Lake Belt. C.D. Van Leeuwen organized an underground mine tour for Ontario Ministry of Natural Resources personnel.

Assistance and technical comments were provided for several ministry programs and land use studies, including the Red Lake District Lake Use Plan.

Visits were made to the 3 producing mines in the Red Lake Mining Division.

Assistance and logistical support were extended to 3 Ontario Geological Survey field parties active in the Red Lake Mining Division in 1982.

Lectures were organized for a local student group and Junior Rangers.

Mining Activity

Three mines were in production during 1982 (Figure 2). A summary of the main developments of the various operations follows. The cooperation of the mine manager of each operation in providing the following information is gratefully acknowledged.

Campbell Red Lake Mines Limited

Campbell Red Lake Mines Limited operated throughout 1982. The company has completed construction of a large indoor recreation complex and several housing units in the townsite. Underground exploration in 1982 has been directed at extending known ore zones and maintaining ore reserves. The mine manager is S.M. Reid.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Red Lake.

Dickenson-Sullivan Joint Venture

In July 1982, the Sullivan Mining Group acquired a 35% interest in the Dickenson Mine and 10% of the Dickenson holdings in Goldquest Exploration Incorporated (Northern Miner, July 8, 1982, p.6). Dickenson Mines Limited is the operator and owner. The mine operated continuously throughout 1982. Underground exploration in 1982 has been directed at extending known ore zones and maintaining ore reserves. The second phase of the company's expansion program, which will increase production from 750 tons per day to 1000 tons per day, is scheduled for completion in August 1983 (Northern Miner, July 1, 1982, p.3). P. Busse is mine manager.

The Griffith Mine

The Griffith Mine, a wholly owned subsidiary of the Steel Company of Canada Limited and managed by Picklands Mather and Company is situated at Bruce Lake 50 km southeast of Red Lake. During 1982, the mine operated at full capacity until the end of June, at which time the operation shut down until the end of September. The mine operated at two thirds capacity for the remainder of the year. J.D. Jeffries is mine manager.

Exploration Activity

Exploration activity during 1982 in the Red Lake Mining Division was lower than in 1981.

Claims recorded up to November 15, 1982 decreased by 50% as compared with 1981 (Table 1), and the number of active claims decreased by 20% as compared to 1981. Between January 1, 1982 and November 15, 1982, 110 633 man days of assessment work were filed as compared to 107 430 man days in 1981, an increase of 3%.

Much of the exploration activity was concentrated in the Red Lake Metavolcanic Belt, with lesser amounts of exploration taking place in the Uchi-Confederation Lakes, Birch Lake, Favourable Lake, and North Spirit Metavolcanic Belts (Figures 1 and 2).

No new orebodies were discovered in 1982, but several past producers and prospects are being re-evaluated.

Getty Mines Limited is re-evaluating the Berens River Mine, a former gold-silver producer located in the Favourable Lake Metvolcanic Belt. The former producer is jointly owned by Zahavy Mines Limited and Getty Mines Limited. Getty Mines Limited is currently conducting an underground exploration program which involves 320 m of drifting on the 225 m level, and 6000 m of underground diamond drilling (Northern Miner, September 23, 1982, p.6).

TABLE 1 SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)	Other (Man Days)	Total Man Days
1982	959	1,930	3,918	20,347	76,622	6,375	7,290	110,633
1981	1,719	1,249	4,889	25,771	66,000	5,152	4,477	107,430
1980	2,220	1,115	4,301	38,482	30,240	871	2,382	71,975
1979	1,068	1,703	3,221	21,108	38,350	3,154	307	62,940
1978	1,207	1,521	3,916	25,574	19,496	2,480	3,447	50,997
1977	2,324	2,395	4,261	12,994	45,050	620	502	59,196
1976	2,705	1,382	4,332	15,680	23,578	380	3,906	46,544
1975	1,368	2,050	2,957	29,377	12,714	960	1,666	44,717
1974	1,339	1,529	3,648	47,362	5,660	3,040	1,657	57,719
1973	1,616	3,157	4,009	60,027	20,474	nil	2,518	83,019
1972	2,219	5,284	5,588	34,261	14,555	5,216	1,838	56,173
1971	1,541	4,922	8,486	73,019	50,920	2,243	1,384	127,566
1970	3,971	7,194	11,759	73,866	329,065	17,606	6,990	427,527
1969	10,900	933	14,772	49,212	66,032	1,320	2,475	119,039
1968	2,451	1,702	4,784	15,367	48,900	1,228	nil	65,395

January 1,1982-November 15,1982 inclusive.

Noranda Exploration Company Limited is re-evaluating the Madsen and Starratt-Olsen Properties in Baird Township. Work being carried out includes studying of old records, and diamond drilling.

Wilanour Resources Limited was active during the first half of 1982. Feasibility studies and bulk testing of the Buffalo Gold Deposit in Heyson Township, and the Wilmar granodiorite zone in Dome Township was completed. Undergound diamond drilling on the Wilmar East Breccia zone was initiated and yielded encouraging results. The company also completed the rehabilitation of the mill on the mine site. The property is presently on a care and maintenance status.

Properties Visited

In 1982, the following mining properties were visited by the Red Lake Resident Geologist's staff:

1) Madsen and Starratt Olsen Properties — Baird Township
2) Buffalo Prospect — Heyson Township
3) Wilmar granodiorite and East Breccia zone — Dome Township
4) Berens River Prospect — Setting Net Lake
5) Redcon Gold Mines — Balmer Township
6) Spirit Lake Mines — North Spirit Lake
7) Shrimp Lake Property — MacDowell Lake area
8) Faulkenham Lake — Heyson Township
9) Redruth and Humlin Properties — Baird and Fairlie Townships
10) Wolf Bay — Todd Township
11) Sandy Creek pegmatite

Ontario Geological Survey Activities

The following projects were carried out by the Ontario Geological Survey in 1982 (for location of the projects *see* Figures 1 and 2).

The Red Lake Synoptic Project continued during the 1982 field season. The objective of the project is a comprehensive tectonic, stratigraphic, and metallogenic synthesis of the Belt (Wallace 1982).

Nelson (1982) carried out a study of the metasediments in the Birch Lake area. The purpose of this project is to develop a stratigraphic, evolutionary, and facies model of the metasediments of the Birch Lake Belt.

Andrews (1982) initiated a multi-year project to study the nature of alteration associated with gold deposits. This project will involve petrological, geochemical, and structural studies. The study will yield valuable information on the mechanisms of ore genesis, processes of metal transport, and the history of ore deposition. It will also aid in the identification of lithogeochemical characteristics useful in exploration for gold deposits.

For additional information on the above listed projects, the reader is invited to consult the Summary of Field Work, 1982, by the Ontario Geological Survey (Ontario Geological Survey, Miscellaneous Paper 106).

TABLE 2 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

GR 207

Open File Reports

OFR 5371
OFR 5382
OFR 5373
OFR 5388

Preliminary Maps - Geological Series

P.2455
P.2571

Preliminary Maps - Data Series

Aggregate Resources Publications

P.2572
P.2484

Federal - Provincial Maps

Coloured Maps

Index to Published Maps: Geological Series
Northwestern Ontario (Stock No.11303)

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

MRC-13, P.2425

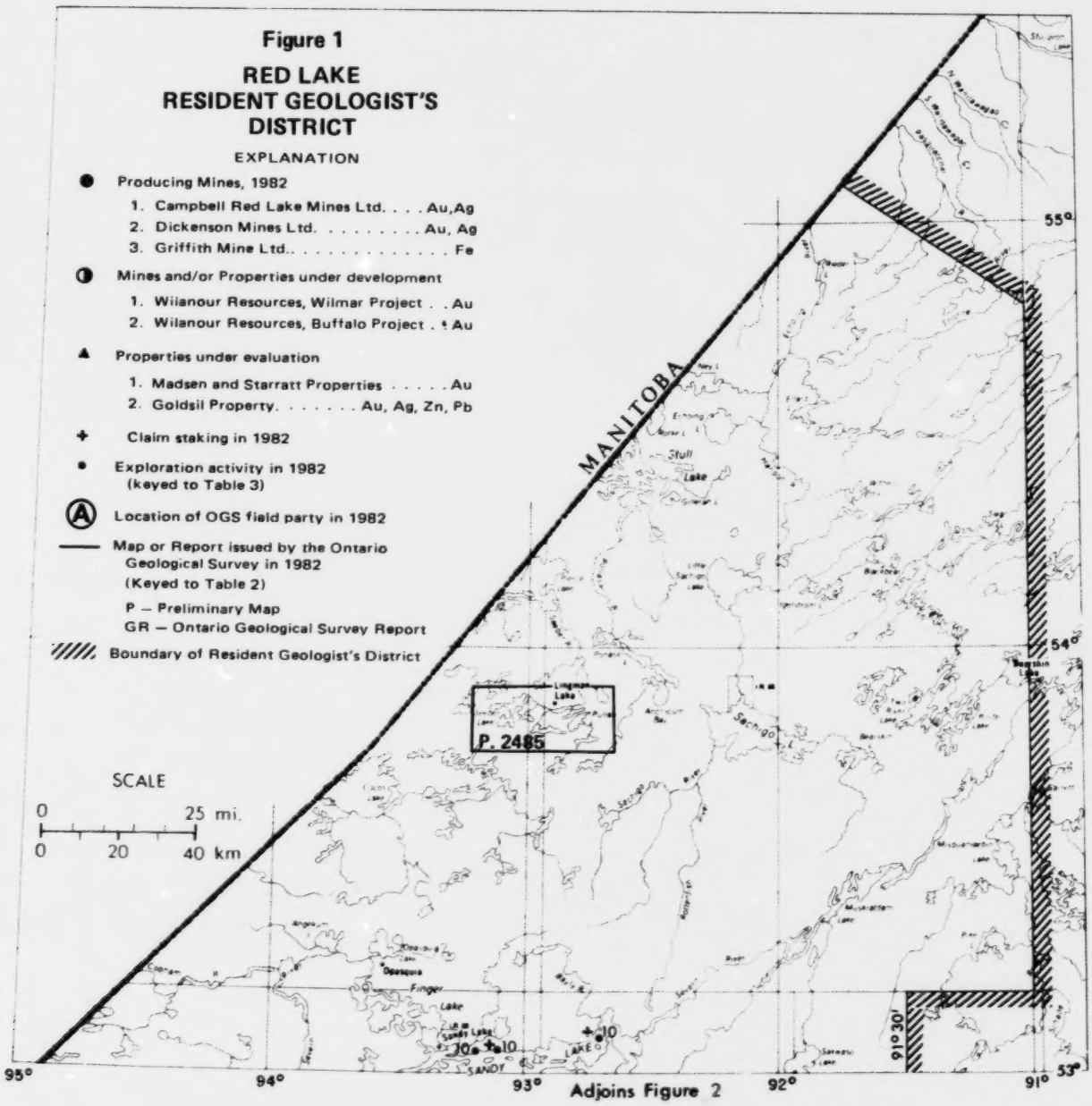
Miscellaneous Reports

MP-77 MP-103 MP-106
MP-97 MP-105

Geological Survey of Canada Open File Reports

Figure 1

RED LAKE RESIDENT GEOLOGIST'S DISTRICT


EXPLANATION
Producing Mines, 1982
1. Campbell Red Lake Mines Ltd. . . . Au,Ag
2. Dickenson Mines Ltd. . . . . Au, Ag
3. Griffith Mine Ltd.. . . . . Fe
Mines and/or Properties under development
1. Wilanour Resources, Wilmar Project . . Au
2. Wilanour Resources, Buffalo Project . . Au
Properties under evaluation
1. Madsen and Starratt Properties . . . . . Au
2. Goldsil Property. . . . . Au, Ag, Zn, Pb
Claim staking in 1982
Exploration activity in 1982 (keyed to Table 3)
A
Location of OGS field party in 1982
Map or Report issued by the Ontario Geological Survey in 1982 (Keyed to Table 2)
P — Preliminary Map
GR — Ontario Geological Survey Report
Boundary of Resident Geologist's District
SCALE
0 25 mi.
0 20 40 km
MANITOBA
P. 2485
Stull Lake
Sachigo
Finger Lake
Sandy Lake
LAKE
55°
54°
53°
95°
94°
93°
92°
91°
91° 30'
Adjoins Figure 2

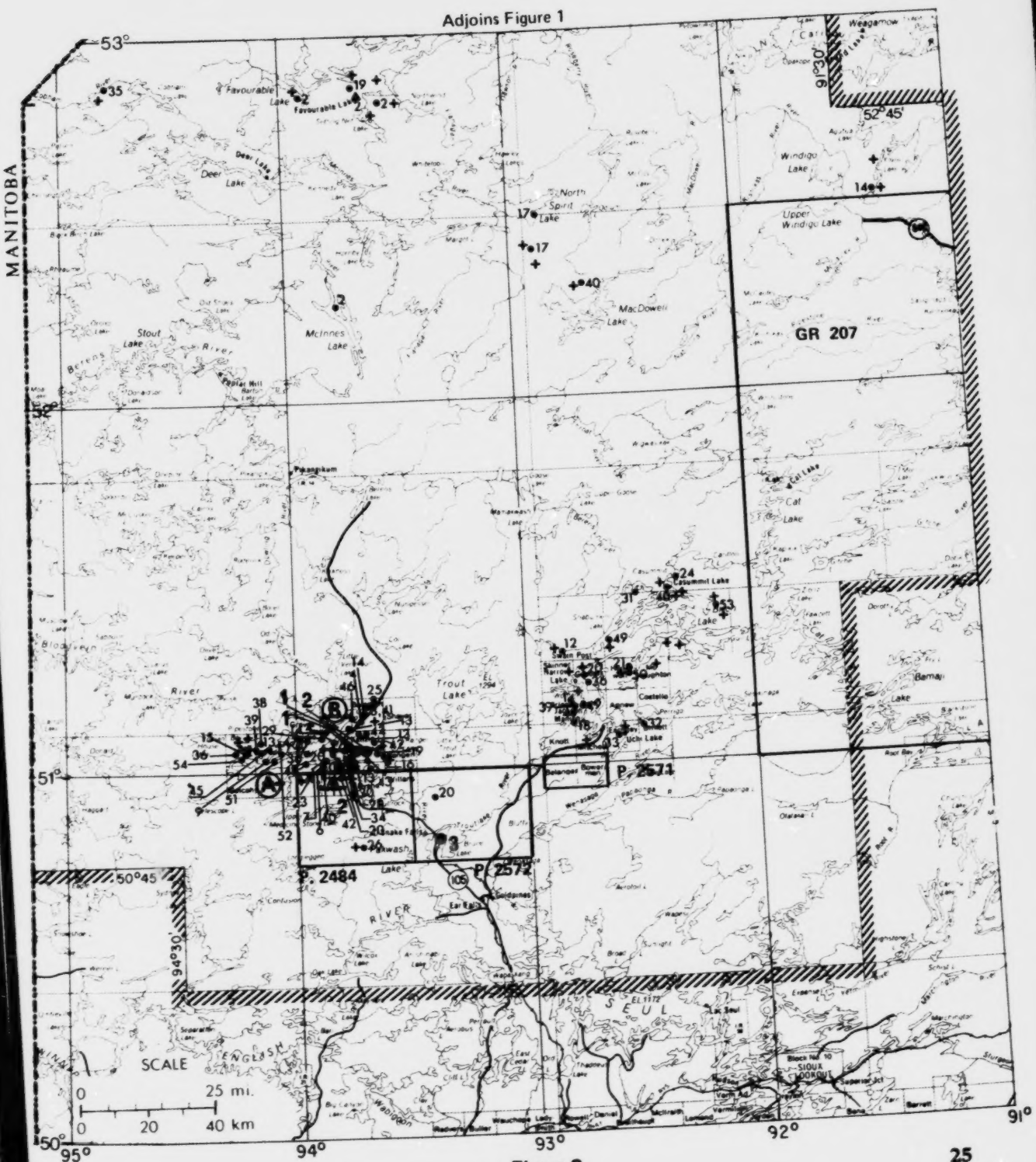

Adjoins Figure 1
MANITOBA
53°
52°
51°
50°
95°
94°
93°
92°
91°
52°45'
94°30'
50°45'
GR 207
P. 2571
P. 2572
P. 2484
Favourable Lake
Deer Lake
North Spirit Lake
Windigo Lake
Upper Windigo Lake
MacDowell Lake
McInnes Lake
Stout Lake
Cat Lake
Trout Lake
Lake St. Joseph
Pekangekum
Sioux Lookout
SCALE
0 25 mi.
0 20 40 km

Figure 2

TABLE 3 **EXPLORATION ACTIVITY DURING THE YEAR.**

The following is a list of individuals and companies known to be engaged in exploration within the Red Lake Mining Division in 1982, and the type of work undertaken in each case. See Figures 1 and 2.

Number on Figure	Individual or Company	Activity
1	Aladin Minerals Limited	Geology and self potential in Corless Township.
2	Amoco Canada Petroleum Company	Linecutting, soil sampling, and geophysics in McInnes, Favourable and Setting Net Lakes areas.
3	Betos Management Limited	Geophysics and diamond drilling in Bateman Township.
4	Bluestack Resources Limited	Overburden drilling, sampling, exploration, linecutting and geophysics in Dome and McDonough Townships.
5	Buckle, J.E.	Geophysics, geology and linecutting in Corless Township.
6	Burr, S.V.	Diamond drilling in Heyson Township.
7	Canflo Mines, Canadian Reynolds Metals and Lynx Canada Exploration	Diamond drilling, geological mapping and geophysics in Heyson Township.
8	Campbell Red Lake Mines Limited	Mining in Balmer Township.
9	Canadian Nickel Company	Airborne geophysics in Todd and Fairlie Townships.
10	Canadian Occidental Petroleum Limited, Lewis,A	Geophysics and geology in the Sandy Lake area.
11	Cormier, R. and Associates	Exploration in Foster Lake.
12	Desmeules, M.	Prospecting in Shabu Lake.
13	Dickenson Mines Limited	Geological mapping, geophysics and diamond drilling in Balmer, Bateman, Byshe, Todd, and McDonough Townships.
14	Dome Exploration (Canada) Limited	Geological mapping, geophysics and diamond drilling in Bateman and Dome Townships and in the Nango and Yoyoy Lakes area.
15	Dumont Nickel Corporation	Diamond drilling in Ball Township.
16	Eldorado Nuclear Limited	Geology and geophysics in Ranger and Balmer Townships.
17	Esso Minerals Canada	Geophysics, linecutting, geological mapping, and sampling in the North Spirit Lake area.
18	Frank, R.	Diamond drilling, trenching and sampling in Dent and Corless Townships.
19	Getty Mines Limited	Geological mapping, geophysics, diamond drilling, and underground exploration in the South Trout and Favourable Lakes areas and in Balmer Township.
20	Gold Fields Canadian MIning	Diamond drilling, linecutting, and exploration in Fairlie, Dome, Byshe Townships South of Otter, Otter and Woman Lakes area.
21	Green, J.A.	Trenching and sampling in Honeywell Township.
22	Griffith Mine (The)	Mining in the Bruce Lake area.
23	Hager, A.	Prospecting in the Red Lake area.
24	Heinrich, B.	Stripping, trenching and sampling in the Casummit Lake area.
25	Herbert, L.	Prospecting in the Red Lake area.
26	Hermiston, W.	Geophysics, trenching and sampling in the Dixie Lake area.
27	Hunt, C.W.	Geochemistry in Aljo Lake.
28	Huston, C.	Geophysics in Dome Township.
29	Independent Exploration Services	Exploration in Dome Township.
30	Kopp, G.	Prospecting in Balmer Township.
31	Kostyniuk, A.	Prospecting, geological mapping, geophysics, and diamond drilling in the Mink Lake area.
32	Lee,N.	Trenching, stripping and sampling in Birkett Township.
33	Long Lac Mineral Explorations Limited	Diamond drilling, geology,geophysics and exploration in Earngey Township and Aljo Lake.
34	McNerney,W.	Prospecting in the Red Lake area.
35	Meekis, D.	Geophysics in the Palsen Lake area.
36	Minorex Limited	Geological mapping, geophysics and diamond drilling in Fairlie and Ball Townships and Woman Lake.
37	Morrison, W.J.	Exploration in Dent Township.
38	Mount Jamie Mines Limited	Exploration in Todd Township.
39	Newest Red Lake Exploration Corporation	Exploration in Todd Township.
40	Noranda Exploration Company, Limited	Geological mapping, geophysics, and diamond drilling in Baird, Heyson, and Todd Townships and the Casummit Lake area. Exploration in the MacDowell Lake area.

TABLE 3 Continued

Number on Figure	Individual or Company	Activity
41	Pemsay Explorers Limited	Diamond drilling and trenching in Bateman Township.
42	Peterson, C.W.	Prospecting, geophysics, trenching and sampling in Balmer and Heyson Townships.
43	Punters Exploration	Diamond drilling, linecutting and geophysics in Balmer Township.
44	Redcon Gold Mines Limited	Diamond drilling in Balmer and Bateman Townships.
45	Rivard, O.	Diamond drilling and prospecting in Todd Township.
46	Sabina Industries Ltd. McFinley Mines Ltd.	Geophysics, overburden drilling and sampling in Bateman Township.
47	Sanderson, A.	Prospecting in the Red Lake area.
48	Selco Inc.	Geological mapping, geophysics and diamond drilling in Fairlie, Baird, Heyson, and Dome Townships.
49	Sherritt Gordon Mines Limited	Geology, geophysics, stripping, and sampling in the Woman and Shabumeni Lakes areas and in Fairlie Township.
50	Shlesinger,H.	Diamond drilling in Honeywell Township.
51	Soltermann, R.	Diamond drilling in Todd Township.
52	Strilchuk, G.	Prospecting, trenching and sampling in Todd Township.
53	St. Joe Canada	Exploration in the Woman and Keigat Lakes areas.
54	Stupack, W.	Prospecting in Ball Township.
55	Wilanour Resources	Surface and underground exploration and development in Dome and Heyson Townships.

Ontario Mineral Exploration Program

During 1982, 7 OMEP grants totalling $182,405 were awarded for designated exploration programs in the Red Lake Mining Division.

Research by Other Agencies

In conjunction with the Ontario Geological Survey's Geoscience Research Grant Program, Campbell *et al.* (1982) studied rare earth elements in felsic volcanic rocks, including some material from the former Zn, Ag producer, the South Bay Mine. Preliminary results suggests that REE elements are mobile in alteration pipes below orebodies, and that the REE patterns may be an indication of the size of the deposit.

Researchers from Queen's University and McMaster University continue to do research at the Campbell Red Lake and Dickenson-Sullivan Joint Venture Gold Mines respectively.

TABLE 4

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

RED LAKE MINING DIVISION

Abbreviations

AEM	-Airborne Electromagnetic Survey	Mag	-Magnetometer Survey	Au	-Gold
A Mag	-Airborne Magnetometer Survey	OVD	-Overburden Drilling	Cu	-Copper
Assess	-Assessment Work	Rad	-Radiometric Survey	Zn	-Zinc
BM	-Base Metals	SA	-Sampling, Assays		
DDH	-Diamond-Drill Hole	STr	-Stripping, Soil Trenching		
EM	-Electromagnetic Survey	Tr	-Trenching		
G	-Ground Survey	rTr	-Rock Trenching		
Geochem	-Geochemical Survey	VEM	-Vertical Loop Electromagnetic Survey		
Gl	-Geological Survey	VLF	-Very Low Frequency		
HLEM	-Horizontal Loop Electromagnetic Survey				

Mineral and Metals Symbols

Au	-Gold
Cu	-Copper
Zn	-Zinc

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Aljo Lake	53J/11	Hunt,Charles Warren	Au	Assess	Mag,Gl,VEM	1981	2.3614	53J/NW
Baird Tp.	52K/13	Cominco Limited	Au	Assess	HLEM,Mag	1981	2.4083	Baird Tp.
Ball Tp.	52M/1	Gold Fields Resources Canada Limited	Au	Assess	VEM,LVF-EM,Mag	1981	2.4172	Ball Tp.
Ball Tp.	52M/1	Stupack, Wm.	Au	Assess	DDH(1) 121'	1982	-	Ball Tp.
Balmer Tp.	52N/4	Dickenson Mines Limited	Au	Assess	DDH(2) 500'	1982	-	Balmer Tp.
Balmer Tp.	52N/4	Dickenson Mines Limited	Au	Assess	VEM	1981	2.4371	Balmer Tp.
Balmer Tp.	52N/4	Dickenson Mines Limited	Au	Assess	DDH(4) 305.83 m	1982	-	Balmer Tp.
Bateman Tp.	52N/4	Dome Exploration (Canada) Limited	Au	Assess	DDH(8) 4701'	1982	-	Bateman Tp.
Bateman Tp.	52N/4	Pemay Explorers Limited	Au	Assess	DDH(4) 1274'	1982	-	Bateman Tp.
Bateman Tp.	52N/4	Sabina Industries Ltd.	Au	Assess	OVD	1981	2.4039	Bateman Tp.
Birkett Tp.	52N/1	Lee, Norman	Au	Assess	rTr,STr	1981	-	Birkett Tp.
Casummit Lake	52N/8	Heinrich, Bradley I.	Au	Assess	rTr	1982	-	52N/SE
Casummit Lake	52N/8	Kostynuk, Alexander	Au	Assess	SA,DDH(2) 229'	1981	-	52N/SE
Casummit Lake	52N/8	Noranda Exploration Company Limited (Kostynuk Bros-Moly Opt)	Au	Assess	Mag,Gl,G,DDH(5) 1504'	1981	2.4303	52N/SE
Corless Tp.	52N/2	Frank, Raymond A.	Au	Assess	STr,rTr	1981	-	Corless Tp.
Dent Tp.	52N/2	Desmeules, M.	Au	Assess	rTr,STr	1981	-	Dent Tp.
Dent Tp.	52N/2	Desmeules, M.	Au	Assess	EM,Mag,Gl,Tr,STr, SA	1981	2.4278	Dent Tp.
Dome Tp.	52N/4	Gold Fields Resources Canada Limited	Au	Assess	VEM,Mag Mag	1981 1981	2.4204 2.4023	Dome Tp.
Dome Tp.	52N/4	Gold Fields Resources Canada Limited (C.W. Peterson)	Au	Assess	DDH(8) 3577'	1982	-	Dome Tp.
Dome Tp.	52N/4	Peterson, C.W.	Au	Assess	Mag	1981	2.3802	Dome Tp.
Fairlie Tp.	52N/4	Desmeules, M., Sanderson, A.	Au	Assess	EM,Mag	1981	2.4202	Fairlie Tp.
Fairlie Tp.	52N/4	Gold Fields Resources Canada Limited	Au	Assess	DDH(7) 3103'	1982	-	Fairlie Tp.
Fairlie Tp.	52N/4	Minorex Limited	Au,BM	Assess	DDH(1) 400'	1981	-	Fairlie Tp.
Fairlie Tp.	52N/4	Minorex Limited	Au	Assess	EM,Gl	1981	2.4125	Fairlie Tp.
Fairlie Tp.	52N/4	Minorex Limited	Au	Assess	EM,Mag	1981	2.4112	Fairlie Tp.
Fairlie Tp.	52N/4	Minorex Limited	Au	Assess	VEM	1981	2.4265	Fairlie Tp.
Fairlie Tp.	52N/4	Nowell, J.	Au	Assess	EM,Mag	1981	2.3989	Fairlie Tp.
Fairlie Tp.	52N/4	Selco Inc.	Au	Assess	DDH(1) 240'	1981	-	Fairlie Tp.
Fairlie Tp.	52N/4	Selco Inc.	Au	Assess	DDH(1) 120'	1982	-	Fairlie Tp.
Fairlie Tp.	52N/4	Sherritt-Gordon Mines, Limited	Au	Assess	SA,STr,rTr	1982	-	Fairlie Tp.
Fairlie Tp,Hammell Lake	52N/4, 52M/1	Minorex Limited	Au	Assess	VEM	1981	2.4080	Fairlie Tp.
Goodall Tp.	52N/2	Minorex Limited	Au	Assess	Gl	1981	2.4176	Goodall Tp.
Hammell Lake	52M/1	Mount Jamie Mines Limited	Au	Assess	Gl	1981	2.4221	52M/SE
Hammell Lake	52M/1	Mount Jamie Mines Limited	Au	Assess	VEM	1981	2.4222	52M/SE
Hammell Lake	52M/1	Soltermann, R.	Au	Assess	DDH(2) 354'	1981	-	52M/SE
Hammell Lake	52M/1	Soltermann, R.	Au	Assess	DDH(3) 554'	1982	-	52M/SE
Hammell Lake	52M/1	Strilchuk, G.	Au	Assess	Tr	1981	-	52M/SE
Hammell Lake,Killala Tp.	52M/1, 52L/16	Beth Canada Mining Company	Au,BM	Assess	HLEM	1979	2.3578	52M/SE
Hewitt Lake	53C/7	Esso Resources Canada Limited	Au	Assess	STr,SA	1982	-	53C/SE
Heyson Tp.	52N/2	Peterson, C.W.	Au	Assess	STr,rTr,SA	1981	-	Heyson Tp.
Honeywell Tp.	52N/2	Shlesinger, H.	Au	Assess	DDH(13) 1843'	1981	-	Honeywell Tp.
Lingman, North of Lingman Lakes	53F/15	Amoco Canada Petroleum Company, Limited	Au	Assess	EM,Rad,Mag,Geochem, Gl,SA	1981	2.3684	53F/NE
McDonough Tp.	52N/4	Dickenson Mines Limited	Au	Assess	EM,Mag	1981	2.4001	McDonough Tp

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
McDonough Tp.	52N/4	Gold Fields Resources Canada Limited	Au	Assess	Mag,EM	1981	2.4229	McDonough Tp.
McDonough Tp.	52N/4	Selco Inc.	Au	Assess	EM,Mag,G	1981	2.4063	McDonough Tp.
Mitchell Tp.	52N/2	Sulpetro Minerals Limited	BM	Assess	DDH(1) 1148'	1981	-	Mitchell Tp.
North of Palsen Lake	53D/15	Meekis,D.	Au	Assess	EM,Mag	1981	2.3857	53D/NE
North Trout Lake	53C/13	Geary, Wm,A. Jr.	Au	Assess	rTr,STr	1981	-	53C/NW
North Trout,Setting Net Lakes	53C/13	Getty Canadian Metals Limited	Au	Assess	AEM	1981	2.4149	53C/NW
Otter,South of Otter Lakes	52K/14,	Gold Fields Canadian Mining	Cu,Zn,Au	Assess	EM,Mag	1981	2.4215	52K/NW
Shabumeni Lake	52N/7	Minorex Limited	Au	Assess	STr,SA	1981	-	52N/SE
Skinner Tp.	52N/2	Moss Resources	Au	Assess	Mag	1980	2.3745	Skinner Tp.

Selected Recent Publications and References

Andrews, A.J.
1982: Alteration, Metamorphism, and Structure Associated with Archean, Volcanic-Hosted Gold Deposits: Preliminary Observations in the Red Lake District; p.180-184 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Campbell, I.H., Coad, P., Franklin, J.M., Gorton, M.P., Hart, T.R., Sowa, J., and Thurston, P.C.
1982: Rare Earth Elements in Felsic Volcanic Rocks Associated with Cu-Zn Massive Sulphide Mineralization; Grant 80, p.20-28 *in* Geoscience Research Grant Program, Summary of Research, 1981-1982, by the Ontario Geological Survey, edited by E.G. Pye, Ontario Geological Survey, Miscellaneous Paper 103, 219p.

Cherry, M.E.
1982: Felsic Intrusion Associated Lode Gold Deposits in the Matheson Area, Cochrane District; p.176-179 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Durocher, M.E., and van Haaften, S.
1982: Geology of Madsen Gold Area, Red Lake; p.185-187 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Hodgson, C.J.
1982: Gold Deposits of the Abitibi Belt, Ontario; p.192-197 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey Miscellaneous Paper 106, 235p.

MacDonald, J.A.
1982: The MacLeod-Cockshutt and Hard Rock Mines, Geraldton: Examples of an Iron Formation Related Gold Deposit; p.188-191 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Nelson, S.E.
1982: Birch Lake Area, District of Kenora (Patricia Portion); p.8-9 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Stott, G.M.
1982: Meen Lake Area, District of Kenora (Patricia Portion); p.10-14 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Wallace, H.
1982: Red Lake Synoptic Project, District of Kenora (Patricia Portion); p.8-9 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

1982 Report of the Sioux Lookout Resident Geologist

D.A. Janes [1], and R.B. Huggins[2]

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Introduction

The Sioux Lookout Office is presently staffed by: D.A. Janes, Resident Geologist; Ralph Huggins, Resource Geologist; and Mary Sawtelle, Geological Secretary.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Sioux Lookout.
[2]Resource Geologist, Ontario Ministry of Natural Resources, Sioux Lookout.

Exploration for base metals was reduced sharply in 1982 due to "soft" metal prices. There was some activity in the Houghton-Hough Lakes area, and an exploratory program was started near Kino Lake in the Big Trout Lake area.

Gold exploration, while somewhat reduced from the level in 1981, has continued at a number of sites within the Patricia Mining Division. Activity has centred around King Bay of Sturgeon Lake, the Pickle Lake area, and the Horseshoe and Opapimiskan Lakes areas north of Pickle Lake.

The start-up of the Goldlund Mine in Echo Township, has stimulated considerable activity in the surrounding area.

Unfortunately, mine shut-downs and closings have become common. The Mattabi and Lyon Lake Mines in the Sturgeon Lake area shut down for 9 weeks during the past summer. The Thierry Mine at Pickle Lake has been closed since April, 1982.

Resident Geologist's Activities

All the operating mines in the Mining Division were visited on several occasions during the year. A continuing liaison was established with Goldlund Mines Limited during their start-up and the subsequent approval of the mine as a "Gomill" custom milling site. Ralph Huggins extended the mapping south of Minnitaki Lake to link up with the Sandybeach Lake mapping (Speed and Palonen, In Press). The South Minnitaki Lake mapping is completed and is described briefly in this publication. Don Janes completed the gold property examination program for Sturgeon Lake and will prepare an Open File Report.

The Ontario Geological Survey released on May 29 the results of a geophysical program carried out over the Sioux Lookout area. A considerable amount of time was spent on the preparation for, and the follow-up of this release.

Considerable time and effort was required for the West Patricia Land Use Plan. The office participated in final drafts of several District Land Use Plans, and attended a number of public information meetings. R. Huggins gave several talks to primary school children. Two lecture and field visit sessions were given to Junior Rangers. This year, a program of outcrop preparation and trench renovation was begun using Junior Rangers. It is planned to continue this program next year.

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 1

Number on Figure	Individual or Company	Activity
1	Abitibi-Price Incorporated	Geological mapping, VLF electromagnetic survey and trenching in the Savant Lake area.
2	Armstrong, G. and Best, A.	Magnetic Survey, diamond drilling and electromagnetic survey in the King Bay-Sturgeon Lake area. Diamond Drilling in Zeemel Lake area.
3	Braeswood Exploration Limited	Diamond drilling in Echo and Pickerel Township. Prospectus.
4	Bernier, K.	Trenching, VLF electromagnetic survey and magnetic survey in the Sandybeach Lake area.
5	Canadian Gold and Metals Incorporated	Diamond drilling, magnetic and electromagnetic surveys in the Botsford Lake area.
6	Canadian Nickel Co. Ltd.	Magnetic survey in Opapimiskan Lake area.
7	Canadian Occidental Petroleum Limited	Diamond drilling in Neawagank Lake and Beard Creek area. Diamond drilling in Nemeigusabins Lake area also.
8	Corporation Falconbridge Copper	Diamond drilling, magnetic survey, VLF electromagnetic survey, line cutting in Evans Lake, Fourbay Lake and Houghton Lake area.
9	Cominco Limited	Diamond drilling in Pickerel Township.
10	Cunningham, L.	Staking, geological mapping in King Bay-Sturgeon Lake area.
11	Dome Exploration (Canada) Limited	Magnetic survey, electromagnetic survey, diamond drilling in the Opapimiskan, Donna and Coucheemoskog Lake area.
12	Du Nor Products	Exploration of Peat Bogs, development of limestone sources in the Sioux Lookout area.
13	Eldorado Nuclear Limited	Geological mapping, Horseshoe Lake area.
14	Esso Resources Canada Limited	Geological mapping, North Caribou Lake area.
15	Fairservice, R.	Prospecting in the Whipper Lake area.
16	Frolek, R.	Staking in the Vermilion Township.
17	Gallant Gold Mines Limited	Diamond drilling in Pickle Lake.
18	Goldlund Mines Limited	Diamond drilling, magnetic and electromagnetic surveys in Echo Township.
19	Gossan Resources	Geological mapping in the Parnes Lake area.
20	Johnson, S. C.	Prospecting in the Sturgeon Lake area. Diamond Drilling in Zeemel Lake area.
21	Kerr Addison Mines Limited	Geological mapping, VLF electromagnetic, magnetic survey and diamond drilling in Vermilion Lake and Fourbay Lake areas.
22	Kozy Explorations	Prospecting in Gullwing Lake area.
23	Kuryliw, C.	Staking in the Sioux Lookout area.
24	Loydex Resources Incorporated	Magnetic Survey, Geological mapping, staking in the Sturgeon Lake-Savant Lake area.
25	Mattagami Lake Explorations Limited	Induced Polarization in the Six Mile Lake area.
26	Marietta Resources Corporation	Magnetic Survey in the Tarp Lake area.
27	Moran Resources	Geological mapping, magnetic survey, geochemical survey in the Sturgeon Lake area.
28	Mid Canada Exploration Services	VLF electromagnetic survey, magnetic survey in the Parnes Lake area.
29	Nahanni Mines Limited	Geological mapping, VLF electromagnetic survey and magnetic survey in the Echo Township, Pickerel Township, Whipper Lake area.
30	Narayan Resources	Geological mapping, magnetic and geochemical surveys, linecutting and staking in the Big Trout Lake area.
31	Newmont Exploration of Canada Limited	Geological mapping in the Pickle Lake area.
32	Noranda Mines Limited	Geological mapping, staking in the Sioux Lookout area.
33	Riocanex	Reconnaisance-geological mapping in the Sturgeon Lake and Echo Township areas.
34	Ramsey, R.	Electromagnetic survey in the Evans Lake area.
35	Sherritt-Gordon Mines Limited	Magnetic survey, electromagnetic survey and geological mapping in the Squaw Lake area.
36	Silver Pack Resources Limited	Staking in the Sturgeon Lake area.

TABLE 1 Continued

Number on Figure	Individual or Company	Activity
37	Sulpetro Minerals Limited	Magnetic and electromagnetic surveys in the Minnitaki Lake area.
38	Steep Rock Iron Mines Limited	Diamond drilling, geolgocial mapping in the Fourbay Lake area.
39	Stargazer Resources Limited	VLF electromagnetic survey, magnetic survey and diamond drilling in the Armit Lake, Benner Township and Grebe and McCubbin Township area. Trenching in the Savant Lake area.
40	Tantalum Mining Corporation of Canada Limited (Tanco Mines Limited)	Geological mapping in the Gullwing Lake area.
41	Tarbush Lode Mining Limited	Diamond drilling, geological mapping in Echo Township and Kabik Lake and Pickerel Township.
42	Umex Incorporated	Diamond drilling, magnetic and electromagnetic surveys in the Beckington Lake area.
43	Urangellschaft Canada Limited	Geological mapping in the Fry Lake area.
44	Wilkinson, D.	Diamond drilling in the McAree Township area.

Mining Activity

The number of active mines remained constant at 3 in 1982. Unfortunately, the start-up of Goldlund Mines was balanced against the indefinite closure of the Thierry Mine at Pickle Lake in April, 1982.

Mattabi Mine and Lyon Lake Mine shut down for 9 weeks during the summer, but re-opened in September. Ore from both mines is milled at Mattabi Mine where a floatation mill produces zinc, copper, and lead/silver concentrates. The mill is currently running at a rate of 2880 t.p.d. Mattabi Mines Limited new shaft is virtually complete to the design depth of 1940 feet. The F-1 pit produced ore for milling at Mattabi Mine this year. One and one-half benches of ore remain in the pit. At year end, approximately 380 people were employed in the Mattabi and Noranda Mines operations on Sturgeon Lake.

Goldlund Mine started production in early summer of 1982. This is the first gold mine to start up in Northwestern Ontario in 30 years. Approximately 45 people are employed on site for this 200 t.p.d. operation which is described in greater detail elsewhere in this report.

The Thierry Mine of Umex Incorporated at Pickle Lake closed down for an indefinite period in April, 1982. A small staff was retained to re-evaluate the economics and mining method. The mine is being maintained on a stand-by basis on the expectation that higher metal prices will allow the reopening of the operation.

A number of announcements have been made concerning plans to re-evaluate the St. Anthony Mine on Sturgeon Lake, and the Pickle Crow and Central Patricia Mines in Pickle Lake. Aubet Resources Limited has stated that they will carry out an exploratory program on the St. Anthony Property with a view to reopening this past producer.

Industrial Minerals

Potting Soil and Horticultural Products

Du-Nor Products expanded production of potting soils and related products during the year. At year end, construction of facilities was under way to treble their preparation and packaging capacity. The company is actively exploring local bogs for raw materials for conversion to branded products mainly for the Western Canada market. Trial shipments of marl have been tested for agricultural liming, and a bulk test is planned. Du-Nor Products presently employs 6 or 7 workers, and is planning to expand their staff with increased production. Apparently, this market is not affected by poor economic conditions.

Sand and Gravel

Approximately 500 000 tons of aggregate were withdrawn in the Sioux Lookout area from deposits on Crown Land. No new sources of coarse aggregate were developed, and supplies are becoming increasingly difficult to find. Work is required to find and develop new sources of coarse aggregate if increased construction costs are to be avoided.

Rock Ballast

The Canadian National Railway operates a quarry at Watcomb which supplies crushed rock for a large part of the mainline between Thunder Bay and Winnipeg. The rock crushed is a dense, tough mafic volcanic rock which retains its angularity with abrasion. Stock piles were drawn down in 1982 and no new production occurred.

Mineral Exploration Activity

Base-metal exploration continued to decline in 1982. Activity was limited to properties currently held. Some activity continued in the Houghton-Hough Lakes area on the Sabine zinc-copper prospect optioned by Umex Incorporated to Falconbridge Copper Limited. A limited amount of activity was noted in Echo Township where diamond drilling of geophysical conductors in areas of zinc-copper anomalies has been continuing for several years.

Claim staking was severely curtailed and parallels the abrupt decline in the mining industry which started last fall. Diamond drilling, geophysical, and geological work submitted for assessment has continued at high levels, but this largely reflects work done previously to maintain claim blocks. The statistics in Table 2 were compiled for the period January 1982 to November 30 of 1982 inclusive for the Patricia Mining Division.

The one bright spot in an otherwise gloomy situation is gold exploration. The start-up of the Goldlund Mine has stimulated new activity in the surrounding area. Nahanni Mines Limited conducted a drilling program on the Quyta Property which gave interesting gold values in several intersections. Braeswood Resources Limited and Tarbush Lode Mining Limited conducted geological and diamond drilling programs on their properties. Cominco Limited conducted a diamond drilling program on the Campbell Group located on the Pickerel Arm porphyry.

The northern part of the Patricia Mining Division was active with Cominco Limited and the Musselwhite Consortium continuing gold exploration in the North Caribou Volcanic Belt. Drilling and exploration programs were centred on and to the north of Opapimiskan Lake. Several companies initiated gold exploration programs on Horseshoe Lake and Liebert Lake to the south of Opapimiskan Lake.

The most interesting area in late 1982 has been Sturgeon Lake. In early 1982, Messrs. Armstrong and Best diamond drilled a zone on the northwestern shore of King Bay and obtained spectacular gold values over good widths in a brecciated quartz-carbonate ladder vein system associated with the quartz veining. This is similar to the Rainbow Island and L. Greene Occurrences to the east of Sturgeon Lake (Janes and Huggins 1982). Another vein system occurs to the north of the Armstrong-Best Prospect and was trenched in the 1930s. Blue quartz from this vein has produced some gold, and visible gold can be found in the trenches. Armstong and Best stripped the southern occurrence and have optioned their property to Steep Rock Mines. Steep Rock Mines has put together a 150-claim block from several groups, and are evaluating the property by geophysical and diamond drilling programs.

Loydex Resources Limited have obtained ground to the west of King Bay where a prospector has obtained low, but significant gold values in quartz-pyrite veins hosted by shears.

This area of Sturgeon Lake has a number of significant gold prospects over a strike length of several km, having similar structural and mineralogical characteristics. Several of the prospects have the potential for at least custom milling ore sources. In fact, the Rainbow Island Property has a small mill on the site.

TABLE 2 **SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT**

PATRICIA MINING DIVISION FROM 1974 to 1982

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)	Total Man Days
1974	1,011	3,223	5,659	38,049.0	6,255	102	44,406
1975	1,019	2,489	3,903	38,492.7	18,953	1,858	59,[illegible]037
1976	1,185	1,120	3,958	27,111.0	11,555	185	38,851
1977	1,261	1,320	3,760	17,880.1	13,931	946	32,757.1
1978	2,018	765	5,094	33,371.3	57,501	600	91,4723
1979	1,012	1,061	5,045	30,869	27,605.4	1,949	60,4234
1980	3,485	1,391	7,068	42,633	13,524	10,800	66,957
1981	2,861	1,582	8,303	42,588	232,184	4,866	287,626
1982	797	2,022	6,988	35,329	74,286	13,785	164,032

TABLE 3 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

GR 195, 200, 207

Open File Reports

OFR 5362 5326
5264 5324
5382

Preliminary Maps - Geological Series

Nil

Preliminary Maps - Data Series

P.2425
P.2293 P.2427
P.2125 P.2395
P.2128 P.2394

Aggregate Resources Publications

Nil

Federal - Provincial Maps

Nil

Coloured Maps

2442 2443 2431
2440 2229 2456

Northern Ontario Engineering Geology Terrain Studies Reports

Nil

Northern Ontario Engineering Terrain Studies Maps

Nil

Sioux Lookout Aerial Geophysical Survey
80553 to 80571 inclusive

Mineral Resources Branch Publications

MP 77 MP 98 MP 100 MP 102 MPBP 15
MP 97 MP 99 MP 101 MPBP 14

Miscellaneous Reports

Airborne Electromagnetic Survey, Sioux Lookout Area, Dist. of Kenora, Maps 80 553 to 80 571 incl.

Geological Survey of Canada Open File Reports

Nil

Goldlund Mine

The Goldlund Mine started up on June 15 with a design capacity of 200 t.p.d. Initially, gold feed came from surface dumps of development ore and bulk samples. This source has been exhausted. The mill is currently running on underground ore from the decline on the first level. Several stopes are being mined concurrently to produce a design head grade of 0.2 ounce gold per ton.

Mining is selective using an up-dip panel stoping method across the 40-foot width of the ore zone. An open pit is being developed to access 50 000 tons of higher grade ore, and should be in production by the start of 1983.

The ore is processed by primary crusher, cone crusher, and a ball mill to an 80% minus 20 mesh grind. Approximately 30% of the gold is recovered by gravity traps on the outlet of the ball mill and is concentrated by tabling. The remaining gold is recovered and concentrated by sulphide floatation. Currently, the sulphide mineral concentrate is sold to a custom mill, but plans are underway to install a cyanide circuit.

The Goldlund Mine has been designated as a "Gomill" site. Goldlund Mines Limited is in process of installing the additional equipment required by a custom mill. Longer term plans involve increasing mill capacity to 400 t.p.d. which could be achieved without major capital investment.

Sioux Lookout Geophysical Release, May 29, 1982

The Ontario Geological Survey released an 8900 line-mile geophysical survey flown by helicopter over an area of the Wabigoon Subprovince centred on Sioux Lookout. Airborne electromagnetic and total field magnetic surveys were done, and the results were released at a 1:20 000 scale. The airborne electromagnetic survey was recorded at 2 frequencies in order to allow for the discrimination of surface effects, and a 60-cycle monitor was incorporated to screen for power line noise.

A reasonable number of map sets were sold and several hundred claims were recorded when the slow pace of exploration activity is considered.

The results are interesting in that a number of structures, known only partly before, have been traced laterally. The Minnitaki Iron Formation, which runs along the southern shore of Minnitaki Lake, is clearly traceable for a minimum of 32 km and is apparently truncated by faulting or facies change in Southeast Bay. A number of small conductors appear to be associated with this iron formation and should be examined in detail. Several gabbro plugs were outlined in the contact zone of the Southern Volcanic Belt and the Basket Lake Batholith. Geological follow-up has confirmed these gabbros, which do not appear to be extensively mineralized in outcrop. The most interest-

TABLE 4 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

PATRICIA MINING DIVISION

SYMBOLS AND ABBREVIATIONS

Au - gold
Ag - silver
Cu - copper
Fe - iron
Pb - lead
Zn - zinc
s - sulphides
py - pyrite
po - pyrrhotite
mo - molybdenite
sp - sphalerite
mag - magnetite
hem - hemitite
gn - galena
cp - chalcopyrite
Tr - trenching
5-DD-486' (5 diamond drill holes, 486 feet total)
Assess - Assessment data
IP - induced polarization
Mag - ground magnetic survey
AM - airborne magnetic survey
EM - ground electromagnetic survey
AEM - airborne electromagnetic survey
VLEM - vertical loop electromagnetic survey
HLEM - Horizontal Loop electromagnetic
GL - Geological survey
Geophys. - geophysical survey
BM - Base metals
PR - Prospectus
m - meters
VLF - very low frequency

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Armit Lake	52 J/7 NW	Stargazer Resources	BM	Assess.	Mag, VLF-EM	1981	2.3874	15 (52 J/7 NE) (43)
	52 J/7 NW	Stargazer Resources	Au,As,Cu,	Assess.	2-DD-1004'	1982		(52 J/7 SE) (46)
Beardy Creek	53 H/12NE	Canadian Occidental	py,po, mag,cp	Assess.	3-DD-533m	1982		4
Beckington Lake	52 J/2 NE	Umex Inc.	py,po,cp	Assess.	3-DD-1042'	1982		47
	52 J/2 NE	Umex Inc.	BM	Assess.	Mag	1982	2.4169	48
	52 J/2 NE	Umex Inc.	BM	Assess.	Mag, EM	1982	2.4158	49
Botsford Lake	52 J/4 NE	Canadian Gold and Metals Inc.	BM	Assess.	Geophys.,Mag,EM	1982	2.3869	22
	52 J/4 NE	Canadian Gold and Metals Inc.	py,po,cp, Au,Ag	Assess.	5-DD-2384'	1982		23
Conant Township	52 J/7 SE	Best, Allan P.	BM	Assess.	Ground EM	1982	2.4199	91
Dona and Couchee-moskog Lake	52 O/8 NE	Dome Exploration	BM	Assess.	Mag, EM	1982	2.3907	36
Drayton Township	52 J/4 SW	Denison Mines Ltd.	py,po,sph Au	Assess.	2-DD-606'	1982		22
Echo Township	52 F/16NW	Goldlund Mines Ltd.	Au	Assess.	Mag, EM	1982	2.3889	57
	52 F/16NW	Sulpetro Minerals	BM	Assess.	Mag, HLEM	1982	2.4043	58
	52 F/16NW	Goldlund Mines Ltd.	Au	Assess.	2-DD-111m.	1982		59
	52 F/16NW	Tarbush Lode	py	Assess.	2-DD-488'	1982		60
	52 F/16NW	Tarbush Lode	BM	Assess.	GL	1982	2.4388	62
Evans Lake	52 J/7 SE	Falconbridge Copper	py,po,sph	Assess.	4-DD-519.2m	1982		87
	52 J/7 SE	Best, Allan P.	BM	Assess.	EM	1982		88
	52 J/7 SE	Ramsey, Raymond G.	BM	Assess.	EM	1982		89
	52 J/7 SE	Falconbridge Copper	py,po,cp sph,gn, cu,zn	Assess.	9-DD-5318'	1982		92
Fourbay Lake	52 J/2 SW	Armstrong, George & Best, Allan P.	BM	Assess.	1-DD-530'	1981		59
	52 J/2 SW	Armstrong, George & Best, Allan P.	Au	Assess.	5-DD-1164'	1981		60
	52 J/2 SW	Armstrong, George & Best, Allan P.	Au	Assess.	5-DD-1856'	1982		61
	52 J/2 SW	Armstrong, George & Best, Allan P.	BM	Assess.	Geophys., Mag, HLEM	1982		62
Grebe Lake-McCubbin Township	52 J/7 NE	Falconbridge Copper	Zn,Cu,Ni	Assess.		1981		44
	52 J/7 NE	Ram Petroleum	BM	Assess.	A Geophys., EM, VLF, Mag.	1981	2.4088	45
	52 J/7 NE	Stargazer Resources	Zn,Au,Ag	Assess.	1-DD-487'	1982		46
Houghton Lake	52 J/7 SW	Corporation Falcon-bridge Copper	BM	Assess.	2-DD-1011'	1982		24
Jutton Township	52 J/8 NW	Stargazer Resources	BM	Assess.	1-DD-487'	1982		52 J/8 NW (46)

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Kabik Lake and Pickerel Township	52 F/16NE	Cominco Limited	AU	Assess.		1981	2.3756	41
	52 F/16NE	Fairservice, R. J.	BM	Assess.	6-DD-2221.2'	1981		42
	52 F/16NE	Sulpetro Minerals	Au,Cu,Zn, Ni	Assess.	HLEM, Mag	1981	2.4050	43
	52 F/16NE	Sulpetro Minerals	Au,Cu,Zn, Ni	Assess.	HLEM, Mag	1981	2.4051	44
	52 F/16NE	Sulpetro Minerals	Au,Cu,Zn, Ni	Assess.	Mag, EM	1981	2.5056	45
	52 F/16NE	Sulpetro Minerals	Au,Cu,Zn, Ni	Assess.	HLEM, Mag	1981	2.4044	46
	52 F/16NE	Tarbush Lode	Au	Assess.	Mag	1982	2.3930	47
	52 F/16NE	Tarbush Lode	Au	Assess.	Mag	1982	2.3879	48
	52 F/16NE	Tarbush Lode	BM	Assess.	1-DD-309'	1982		49
	52 F/16NE	Tarbush Lode	BM	Assess.	4-DD-925'	1982		50
Lomond Township	52 K/1 SW	Sulpetro Minerals	BM	Assess.	Mag, EM	1982	2.4053	30
	52 K/1 SW	Sulpetro Minerals	BM	Assess.	Mag, EM	1982	2.4055	31
	52 K/1 SW	Sulpetro Minerals	BM	Assess.	Mag, EM	1982	2.4052	32
	52 K/1 SW	Sulpetro Minerals	BM	Assess.	Mag, EM	1982	2.4054	33
McAree Township	52 F/16SW	Nova-Co Expl. Co.	BM	Assess.		1982	2.3761	31
	52 F/16SW	Sulpetro Minerals	Au,Cu,Zn, Ni	Assess.	Mag, HEM	1982	2.4042	32
	52 F/16SW	Tarbush Lode	BM	Assess.	4-DD-1214'	1982		33
Neawagank Lake	53 A/5 NW	Canadian Nickel Co.	BM	Assess.	Mag	1982	2.4115	16
Nemeigusabins Lake	53 H/12 SW	Canadian Occidental Petroleum	BM	Assess.	8-DD-1267.5m	1982		13
Parnes Lake	52 G/13 NW	Sulpetro	Au,Zn,Cu, Ni	Assess.	HLEM, Mag	1982	2.4048	27
	52 G/13 NW	Sulpetro	Au,Zn,Cu, Ni	Assess.	HLEM, Mag	1982	2.4047	28
	52 F/13 NW	Sulpetro	Au,Zn,Cu, Ni	Assess.	HLEM, Mag	1982	2.4045	29
	52 F/13 NW	Mid Canada Expl.	BM	Assess.	Geophys., VLF, Mag	1982	2.3860	30
Penassi and Valora Lakes	52 G/14 SE	Seagull Resources	Au,Cu,Mo, Fe	Assess.	Isomag,AEM	1982	2.3760	94
	52 F/14 SE	Seagull Resources	Au,Ag,Cu, Zn	Assess.	6-DD-4661'	1982		95
	52 F/14 SE	Seagull Resources	py,cp,sph,	Assess.	2-DD-1662'	1982		96
	52 F/14 SE	Seagull Resources	mag,py	Assess.	2-DD-934'	1982		97
	52 F/14 SE	Seagull Resources	py,cp,sph	Assess.	4-DD-4298'	1982		98
	52 F/14 SE	Seagull Resources	py,mag,cp	Assess.	1-DD-1467'	1982		99
Savant Township	52 J/9 SW	Stargazer Resources	As,Au,Cu, Zn	Assess.	2-DD-590', Tr.	1982		52 J/7 NE (46)
Sixmile Lake	52 G/15 NW	Mattagami Exploration	BM	Assess.	5-DD-1726'	1981		115
	52 F/15 NW	Mattagami Exploration	BM	Assess.	I.P.	1982	2.4101	117
Squaw Lake	52 J/2 SE	Sherritt Gordon	BM	Assess.	Mag, EM, GL	1982		48
Tarp Lake	52 O/9 SE	Marietta Resources	BM	Assess.	Mag	1982	2.3812	39
Vermilion Additional Township	52 K/1 SE	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		18
	52 K/1 SE	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		17
Webb Township	52 F/15 NE	Selco Inc.	BM	Assess.	GL	1981	2.4422	25
	52 F/15 NE	Patino Mines Ltd.	py,cp,cu, mo	Assess.	GL, Mag, EM	1981	2.4366	23

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Whipper Lake	52 K/1 SW	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		33
	52 K/1 SW	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		30
	52 K/1 SW	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		31
	52 K/1 SW	Sulpetro Minerals	Au,Zn,Cu, Ni	Assess.	HLEM, Mag.	1981		32
Kabik Lake & Pickerel Township	52 F/16 NE	Braeswood Expl.	Au	Assess.	PR	1982		61
Goebel Lake	53 B/9 SW	Armstrong, Best, Peal & Johnson	Base Metals	Assess.	5-DD-1779*	1982		18

ing results of the survey were the confirmation of 3, very long, continuous conductive zones stretching virtually the length of the survey. These were known previously from examination of sparse outcrops. One of them (Vermilion Pyrite Mine) has been a source of acid grade pyrite. Follow-up work on the other 2 sulphide zones has shown that (at least in part) these are mineralized shear zones containing pyrite, pyrrhotite, and sparse chalcopyrite. To date, no gold mineralization has been reported in these zones, but it should not be overlooked as a possibility. These conductors are of considerable theoretical interest since at least one of them appears to have some of the characteristics of massive sulphide zones, yet are not related to any felsic volcanic centre. It is proposed to do sampling along the extent of these conductors wherever possible in order to establish their chemical characteristics.

Additional geological insights were gained into the structure of Southeast Bay and the stratigraphy of the Patara Group metasediments. This is particularly interesting in view of several gold occurrences which are known to exist in the Patara Group. It is hoped, at some future date, to extend this survey south to the Dinorwic area in order to complete the geophysical coverage of this area.

South Minnitaki Lake Mapping

This project was initiated in 1979 and completed in 1982. It was done to fill in mapping south of Minnitaki Lake between the Sandybeach Lake and Flying Loon Lake areas. The area is bounded by Latitudes 50°00′N to 49°48′N and Longitudes 91°45′W to 92°25′W. Field work was done in 1979 by A. Speed and assistants, and in 1981 and 1982 by R. Huggins and assistants. The area is accessible by water from Sioux Lookout and by a network of logging roads north from Highway 17 near Ignace.

History

The area of study had not been mapped in detail. Johnston (1969) mapped to the north in the Western Minnitaki and Abram Lake areas. Trowell *et al.* (1980) carried out a reconnaissance survey in the Flying Loon Lake area which covers part of the study area. Speed and Palonen (in preparation) mapped Sandybeach Lake to the west of the project area.

Surficial Deposits

Heavy ground moraine and lacustrine deposits mantle much of the area. A kame complex with multiple beach ridges occurs on Southeast Bay and is a candidate to be a park under the Ontario Ministry of Natural Resources parks system plan. Because of the heavy overburden, outcrop density is very low to non-existent near the "greenstone"-granite contact, but the contact can be is traced by geophysical methods.

Geology

The area (Figure 3) forms part of the Wabigoon Subprovince of the Superior Province and is underlain by the mixed volcanic sedimentary assemblages of the Wabigoon Volcanic Belt (Trowell, Blackburn, and Edwards 1980). The study area is underlain in the north by felsic and mafic volcanic rocks of the Central Volcanic Belt and the Abram and Minnitaki Groups, which are a mixed assemblage of sandstone, mudstone, and conglomerates. The Southern Volcanic Belt underlies the above rocks, and is intruded to the south by the Basket Lake Batholith of quartz dioritic to granodioritic composition. Regional strikes trend from northeast to east, and many of the major units are suspected to be in fault contact. A major fault system extends from Miniss Lake in the north to Wabigoon Lake in the south. Locally, this system outcrops in Abram and Minnitaki Lakes. Several early and late faults occur normal to this major fault zone, and considerably complicate interpretation of the relationship between the various stratigraphic units. An airborne geophysical survey released by the Ontario Geological Survey, covering all of the study area was released in 1982 and

aided in some reinterpretation of contacts and gross structure of the area.

A large iron formation on the southern shore of Minnitaki Lake has been traced for at least 36 km. An interpreted fault is projected to lie along the southern shore of Minnitaki Lake. A minor fault within Southeast Bay may be rotated by the main faulting.

The contact between the Basket Lake Batholith and the Southern Volcanic Belt has been intruded by late hypabyssal gabbros near Kabikwabik and Cole Lakes. These gabbros have been partly explored, but are not assessed for possible mineralization. The gabbro intrusions are fine- to medium-grained amphibole-plagioclase rocks and generally have no tectonic fabric. The northern contact of these intrusions is marked by a thin layer of porphyritic basalt containing cream-to-yellow plagioclase phenocrysts up to 6 cm in diameter. Examples of this unit crop out on the Suzanne River and Kabikwabik and Little Goose Lakes.

Economic Geology

Little exploration has been done over the area for base metals and gold. The Minnitaki Iron Formation has been explored to some degree and tonnage estimates made for at least 1 property. A few gold and base-metal showings are known, but have not been followed up. Molybdenum mineralization was discovered in a sheared part of a small granodiorite plug near Keikewabik Lake.

Recommendations

Quartz veins hosted by shears occur near the contact of the Minnitaki Group with the Southern Volcanic Belt near Southeast Bay. These reins have several gold occurrences and have a history of early exploration. These areas are considered to have good potential for gold exploration. Such areas, however, are difficult targets because of heavy drift cover and extension under lakes.

Properties Visited, Under Evaluation, and or Exploration

Onepine Lake—Poisson Township

The prospect is located south of a small lake near Savant Lake. The showing has been known since the 1940s and has had extensive surface work done on it. The property is underlain by metasediments that are predominately composed of wacke and slatey siltstones. The prospect occurs within a band of iron formation on the nose of a fold close to a shear.

The iron formation is approximately 25 m wide and 3 m of the mineralized section is exposed in a trench. The quartz lenses of the iron formation are up to 50% replaced by euhedral pyrite. Pyrite cubes range up to 8 mm in diameter. The mineralized zones are surrounded by a halo of disseminated, fine-grained pyrite. The mineralized zones range up to 10 cm in width and are cut by thin quartz veinlets. Grab samples, taken by R. Huggins from the massive zones, range from 0.5 to 0.6 ounce gold per ton. Other samples from the disseminated pyrite zones and the unaltered iron formation range from trace to 0.12 ounce gold per ton. A grab sample taken on another adjacent claim group within the shear zone yields 0.32 ounce gold per ton.

The magnetic signature of the iron formation extends at least 2500 feet from the shear, but no information about the extension of gold values is available.

This property is interesting since it is typical of a number of deposits near Savant Lake which contain gold in pyrite, hosted in quartz veins, and zones in volcanic rocks and in iron formation. Little, if any, free gold is known from this area and many likely prospects could have been overlooked.

Sandybeach Lake

The prospect is located to the east of Sandybeach Lake in McFie Township. It is accessible by bush road from Highway 72, south of Sandybeach Lake.

Originally, the prospect was known as the Alto-Gardner showing, from the original discoverers. Little work has been done on the showing since 1940.

The area is underlain by mafic flows of the Southern Volcanic Belt of the Wabigoon Subprovince. A large shear or fault appears to run through the showing, and the mineralized zone is located in a quartz vein within this shear. The quartz vein is itself brecciated and carbonate rich. The minerals are pyrite, chalcopyrite, and rare amounts of visible gold.

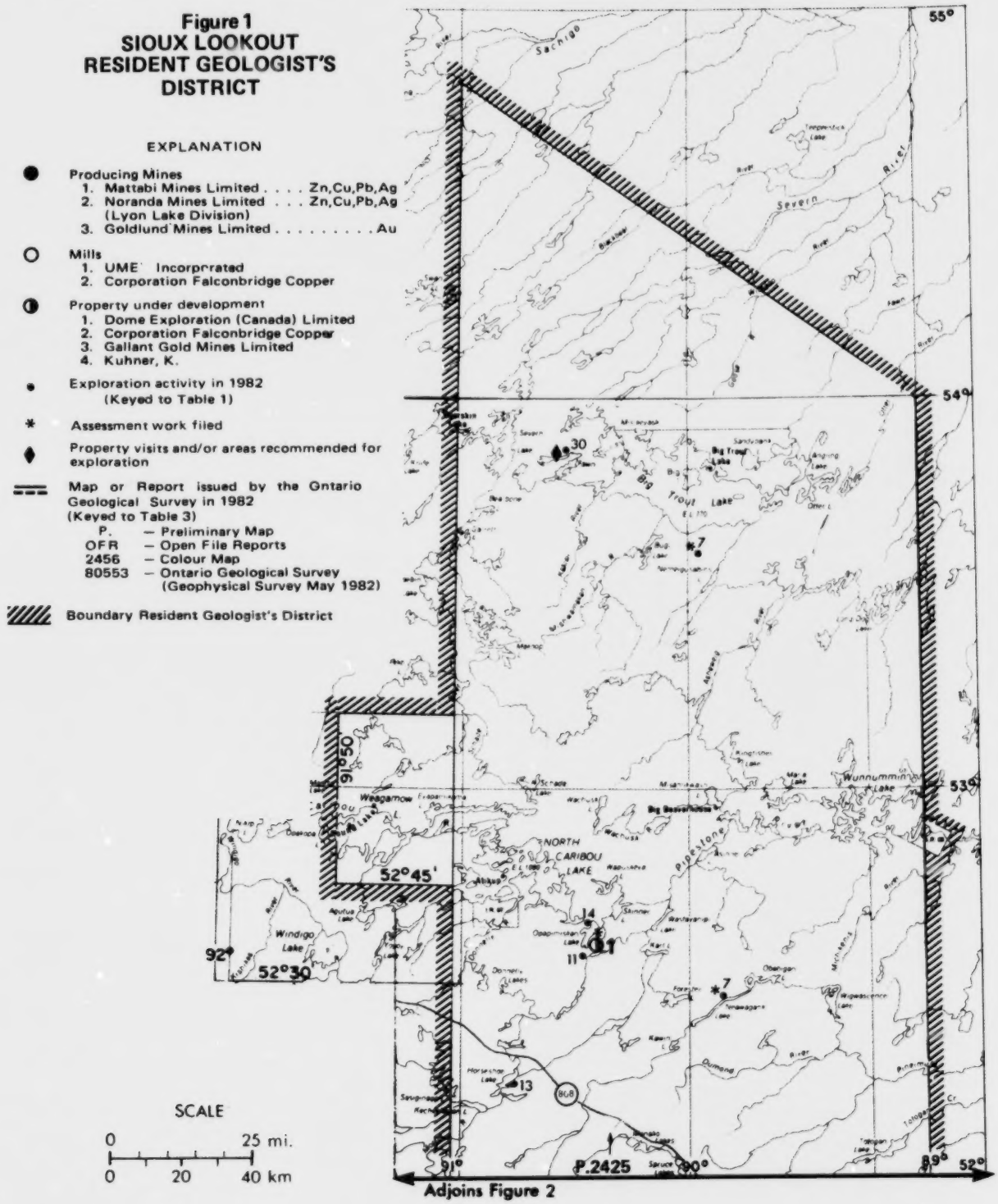
The shear zone extends for several thousand feet and has an old shaft or pit approximately 1000 feet northeast along strike.

The location of gold values, which vary from trace to visable gold but probably average 0.2 ounce gold per ton, indicate that cross vein structures may control gold mineralization. Because of the length of the shear zone, a considerable amount of strike length is available for exploration. Ore could be trucked to the mill because of the proximity of the Goldlund Mill. It must be emphasized that a considerable amount of surface work would have to be done to develop any ore if, in fact, it exists.

Sturgeon Lake Properties

The senior author has spent 1 month over the last 2 years studying a number of small showings, prospects, and one past producer on Sturgeon Lake (Janes and Huggins 1982; Janes 1981). Recently, interest in the King Bay area of Sturgeon Lake has increased with several companies conducting diamond drilling and

Figure 1
SIOUX LOOKOUT RESIDENT GEOLOGIST'S DISTRICT



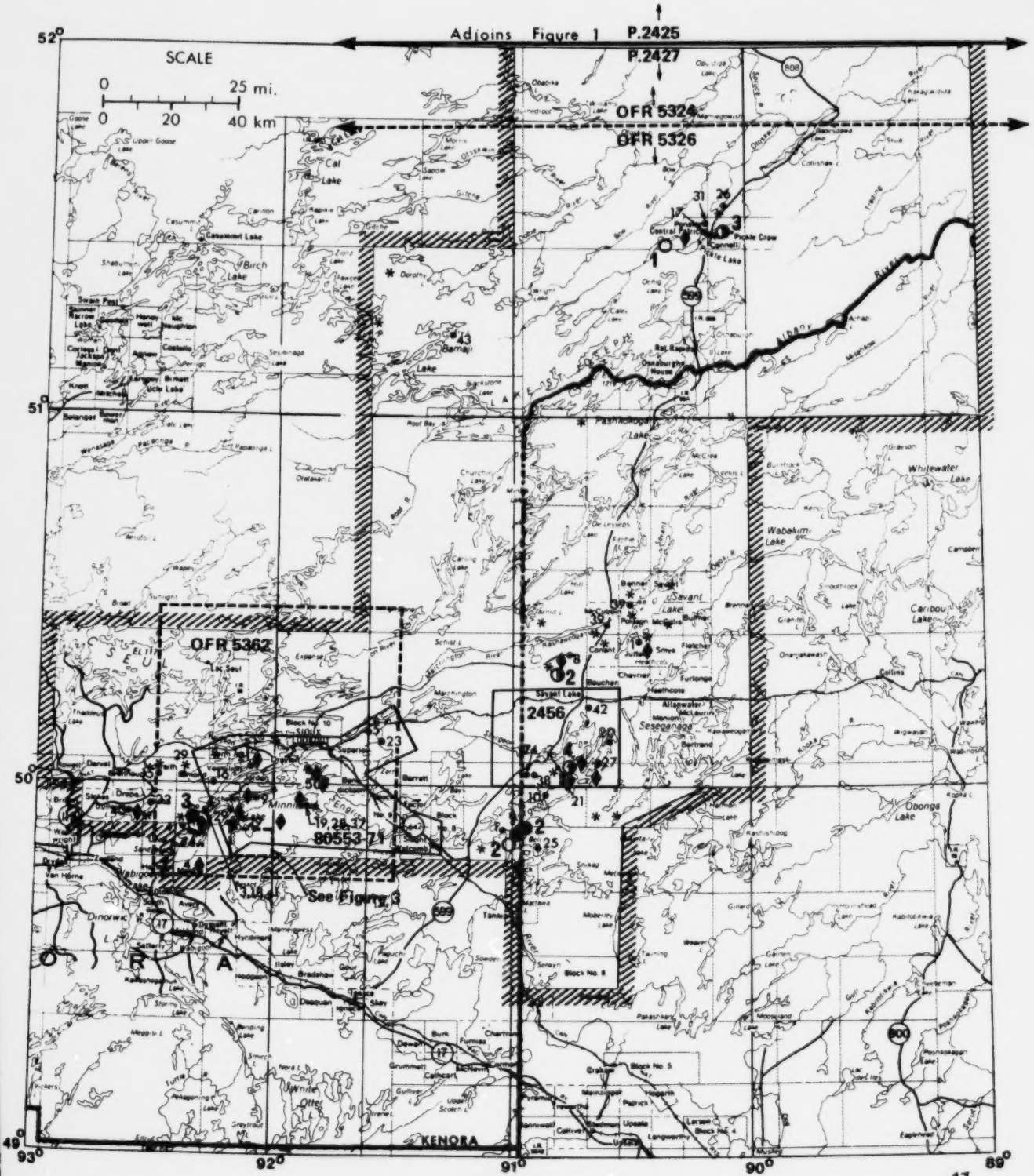

Adjoins Figure 1
P.2425
P.2427
OFR 5324
OFR 5326
SCALE
0 25 mi.
0 20 40 km
OFR 5362
2456
80553-71
See Figure 3
KENORA
52°
51°
50°
49°
93°
92°
91°
90°
89°

Figure 2

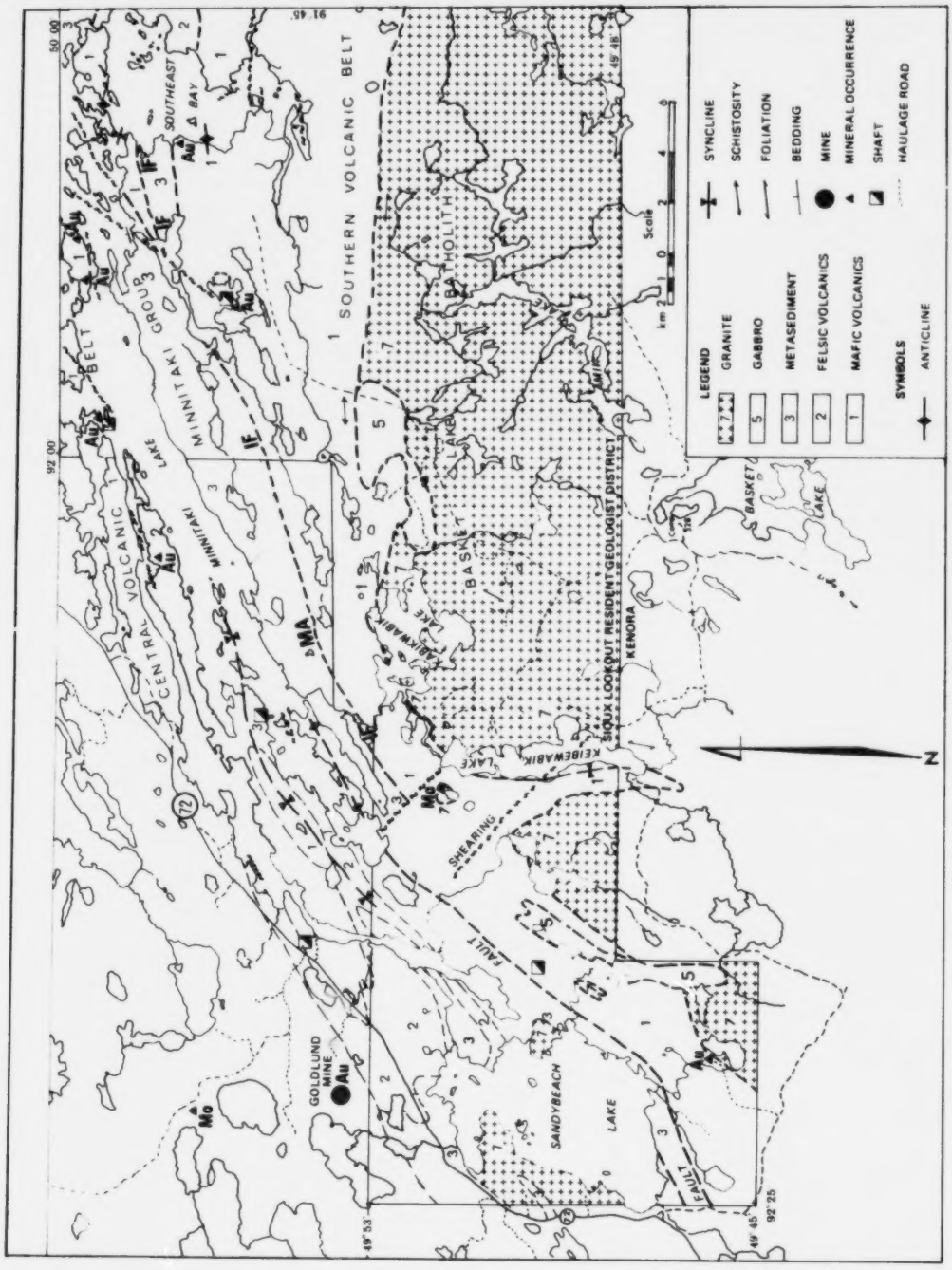


Figure 3 – Geology of the South Minnitaki Lake Area.

geophysical programs. Historically, interest centred on the southern shore of King Bay where gold-bearing blue quartz boulders were found and were worked for their gold values. Several shafts and at least 1 adit were driven on quartz veins in sheared mafic volcanic rocks, replaced iron formation, and veined quartz-feldspar phorphyry.

Current interest is centred on a zone to the north of King Bay stretching from Highway 599 to the East Bay of Sturgeon Lake. A number of relatively narrow quartz-gold occurrences and several excellent prospects are known in the zone. These share common characteristics and appear to be structurally related to a east-trending shear zone which parallels the intrusive contacts of a granodiorite batholith and minor porphyritic sills. The gold occurrences are associated with carbonate replacement zones and breccias. These are contained in blue to black quartz in veins and minor ladder vein systems which contain pyrite ± chalcopyrite ± visible gold. Gold values and quartz widths vary widely, but values from 0.2 ounce gold per ton to 5 ounces gold per ton are found. The veins tend to be lensoidal in form, and range from 50 m to 200 m in length. The general strike is east-trending, but swings to northeast near East Bay. Several new gold occurrences have been found near Highway 599. These appear to be wider veins, but run lower in grade, ranging from trace to 0.05 ounce gold per ton over several m. The occurrences are shear zone hosted quartz veins with euhedral pyrite up to 1 cm in diameter.

These new occurrences appear to be aligned along a separate shear than that hosting the veins to the north of King Bay, and may be related to the East Bay sulphide zone.

A number of companies have exploration and development programs in this area. Steep Rock Mines Limited is working on the Armstrong-Best projects which seen, at present, to have the most promise. However, few of the areas have been adequately diamond drilled. It is very early to adequately assess any of the other properties.

St. Anthony Mine

The mine is located on the eastern shore of the North Bay of Sturgeon Lake, approximately 14 km south of the Savant Lake. No road access exists to the site, but it can be reached by float-equipped aircraft from Sturgeon or Couture Lakes. The closest boat access is from Highway 599 to the Horizontal Bay road which leads to Camp Asgard on Sturgeon Lake.

The property was discovered in 1898 and was actively developed between 1899 and 1903 by the Jack Lake Mining Company. A shaft was driven and a stamp mill installed which was worked intermittently between 1905 and 1921. A considerable amount of cross-cutting and internal shaft and winze development was completed. In 1928, the mine was re-activated as the St. Anthony Gold Mine. An inclined shaft was sunk, and a winze developed to the 1000-foot level. A modern grinding circuit and cyanide recovery system were installed at this time. After a slow-down between 1930 and 1934, the mill reopened at a design rate of 125 t.p.d. and remained in operation until 1941 when war conditions forced a shutdown. In total, 63 310 ounces of gold and 16 341 ounces of silver were produced at an average grade of 0.19 ounces gold per ton.

The main ore zone is a relatively wide, essentially vertical quartz vein which transects at a low angle the contact of the Sturgeon Lake Granodiorite and the mafic volcanic rocks. The volcanic rocks are schistose greenschist facies metabasalts which are locally rich in carbonate near the vein contact. The vein pinches and swells, but ranges from 4 to 20 feet in several open cuts. The ore zone is one of a series of veins filling brittle fractures in the granodiorite and volcanic schist localized along the north-trending contact of these rocks. A number of these veins have a pronounced sericitic alteration halo where they are located in the granodiorite. The Number 1 vein has simple mineralogy of coarse euhedral pyrite, finer pyrite, chalcopyrite, galena, sphalerite, and rarely visible gold in a gangue of quartz and Ca-Fe carbonate. A limited amount of exploration was done on the Number 2 vein and the "diorite" zone. A number of quartz porphyries occur on the property. These are difficult to assess since several late phases of the Sturgeon Lake Granodiorite are porphyritic.

Detailed mapping of the granitoids in the area may show that the St. Anthony leuco-granodiorites are hypabbysal sills or plugs. These bodies formed beneath the felsic centre that outcrops on the East Bay of Sturgeon Lake. Certainly, late porphyritic leucogranitoids are widespread in this area and are associated with a number of gold occurrences.

The mine has been intensively worked to the 750-foot level along a strike length of at least 1000 feet. Some ore is developed below this to the 1000-foot level. The Number 2 vein and the "diorite" zone need to be explored.

Presently, the mine is flooded to lake level. Deep exploration would require de-watering the underground developments.

Patara Group Metasediments — Wabigoon Subprovince

The Patara Group outcrops in a linear belt centred on the Town of Sioux Lookout. These rocks have been made classic by the pioneering Early Precambrian (Archean) sedimentary studies of Pettijohn. The group forms a transition between the volcanics of the Northern Volcanic Belt and the overlying sediments and felsic volcanic rocks of the Central Volcanic Belt. Excellent exposures are available, but large areas are mantled by heavy glacial cover. The base of the Patara

Group is conformable to paraconformable on the underlying Botham Bay Volcanics, and the upper contacts in most places are obscured by major and minor faults and are not known in detail for this reason. The basal contact of the Patara Group is in part sheared and carbonate replaced. A number of minor gold anomalies have been reported and one has been explored to some extent. The upper contacts have several very interesting gold occurrences. At Vermilion Lake, quartz porphyries which intrude the Patara Group are sheared and carry significant (0.2 ounce gold per ton) values in arsenopyrite-bearing veins. On Highway 72, near the limits of the Town of Sioux Lookout, narrow quartz veins have yielded spectacular gold samples close to a mylonitic contact with a trondhjemite sill. Several other occurrences are associated with shearing or fault zones. At least 2 specific types of gold occurrences are known. One type of occurrence is associated with arsenopyrite in fine euhedral laths and contains no visible gold. The other occurrences are "classical" quartz-carbonate veins containing chalcopyrite, pyrite, pyrrhotite, and visible gold. A much closer investigation of these rocks is warranted. Preliminary investigations suggest that the low levels of gold may be associated with the fine-grained carbonate replaced metasediments near the basal contact, and that the higher grade quartz veins are associated with volcanogenic conglomeratic sediments higher in the section.

Recommendations for Exploration

It is difficult to recommend exploration because of the current state of the base-metal mining industry. The number of exploration projects near the intersection of Highway 599 and the Marchington Road, however, cannot be ignored. Two properties, the Sabine Prospect and the Hadley Occurrence, are zinc-copper-silver zones with classical massive sulphide characteristics. These properties have characteristics best explained by fault disruption. The existence of obvious alteration zones in the country rocks suggest that structural studies to evaluate the possibility of down-dip or along-fault extensions of these zones would be advisable.

The Sturgeon Lake, Savant Lake, and Minnitaki Lake areas have many gold prospects. However, it must be recognized that the techniques used for base-metal exploration are not appropriate for gold. Most active geologists and mining engineers have no experience exploring and developing the narrow veins typical of gold deposits in these areas. For this reason, major mining companies, with several notable exceptions, have had little success in developing gold mines. This presents a challenge and an opportunity for small- to medium-sized companies to enter this field.

These companies should concentrate on the many showings already known and develop as much information as possible by surface work and bulk sampling. These companies should resist the tendency to over-drill prospects early in the program, and should consider generating cash flow by selling ore to a custom mill as early as possible. The best indications of overall grade are mill returns from a large bulk sample. The "Gomill" program was designed to enable junior companies to develop properties rapidly and inexpensively, and to generate cash flow at an early stage. The existence of a custom mill in the Sioux Lookout area at the Goldlund Mine is the reason the authors strongly recommend exploration and development of properties in this area.

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1982 Report of the Thunder Bay Resident Geologist

G.C. Patterson[1], J.K. Mason[2], and B.R. Schnieders[3]

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[1]Resident Geologist, Ontario Ministry of Natural Resources, Thunder Bay.
[2]Resource Geologist, Ontario Ministry of Natural Resources, Thunder Bay.
[3]Resource Geologist, Ontario Ministry of Natural Resources, Thunder Bay.

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Introduction

Current staff complement in the Thunder Bay office includes: K.G. Fenwick, Regional Mineral Resources Coordinator, G.C. Patterson, Resident Geologist, J.F. Scott, Resource Geologist, and A.R. Dowton, Secretary.

Contract staff were employed in a variety of projects. F.J. Kristjansson, Geologist, provided geological input into district land use plans, conducted aggregate resource inventories, and a clay project. The Beardmore-Geraldton Economic Geologist Program was supervised by J.K. Mason, Resource Geologist, who was assisted by C.D. McConnell, Resource Geologist. B.R. Schnieders, Resource Geologist, assisted by R.J. Dutka, Resource Geologist, continued to work on the Atikokan Economic Geologist Program. A.A. Speed and B. Love, Resource Geologists, prepared data series compilation maps and geological data inventory folios for the Beardmore-Geraldton area. G.H. Brown and H.M. Bordages who are Resource Geologists, were contracted at different times to work on gold compilations. A. Erdic assisted on the clay project and worked on a part-time basis. L. Battiston, Secretary, worked as an Experience '82 student and a part-time secretary. M. Kennedy, Resource Geologist, supervised the Mining Sector Work Program in the region, and prepared geological data inventory folios for the Beardmore-Geraldton area. R. Foster, as part of a cooperative education program, assisted F.J. Kristjansson.

Acknowledgments

F.J. Kristjansson prepared the sections on Aggregate Resources and Clay.

J.F. Scott wrote the section on uranium exploration in the region. The tables and maps were compiled by G.H. Brown. The description of the Atikokan Economic Geologist Program was written by B.R. Schnieders with assistance from R.J. Dutka. J.K. Mason, with help from C.D. McConnell, wrote the section on the Beardmore-Geraldton Economic Geologist Program.

Resident Geologist's Activities

G.C. Patterson started duties as Resident Geologist in March of 1982. Before this date, W.H. McIlwaine, presently Northern Regional Development Economist with the Ontario Ministry of Northern Affairs, was the Resident Geologist.

Much of the Resident Geologist's time was spent consultating with prospectors and with geologists from exploration and mining companies. A number of field trips were made in the Atikokan area and the Beardmore-Geraldton area. Property visits were carried out in the Hemlo-Schreiber-Middleton area and the Fort Hope area. The Resident Geologist led 3 field trips for Ontario Ministry of Natural Resources personnel in the Hemlo area. Three talks were presented: "Cobalt-Silver Mineralization at Cobalt, Ontario", which was given at the University of Minnesota, Duluth; "Industrial Minerals of Northwestern Ontario", which was given at Ottawa; and lastly, "The Role of the Ontario Geological Survey", which was given at Lakehead University, Thunder Bay, Ontario.

Office staff conducted tours and gave talks on local geology to school classes and other groups, and made presentations to Junior Ranger Camps. B.R. Schnieders gave a paper, "Gold Mineralization in the Atikokan Area", at the Institute of Lake Superior Geology meeting in International Falls, Minnesota. J.K. Mason and B.R. Schnieders also presented poster displays at the Ontario Geological Survey's Research Seminar held in Toronto during December. Prospector sessions for prospectors were given by J.K. Mason and B.R. Schnieders at Fort Frances, Atikokan, Beardmore, and Geraldton.

The office staff, particularly F.J. Kristjansson, continued work in land use planning by: providing geological input into district land use plans, proposed land and park reserves, environmental issues, and road and proposed transmission line placements. By assessing aggregate potential, F.J. Kristjansson assisted a number of townships in preparing official plans.

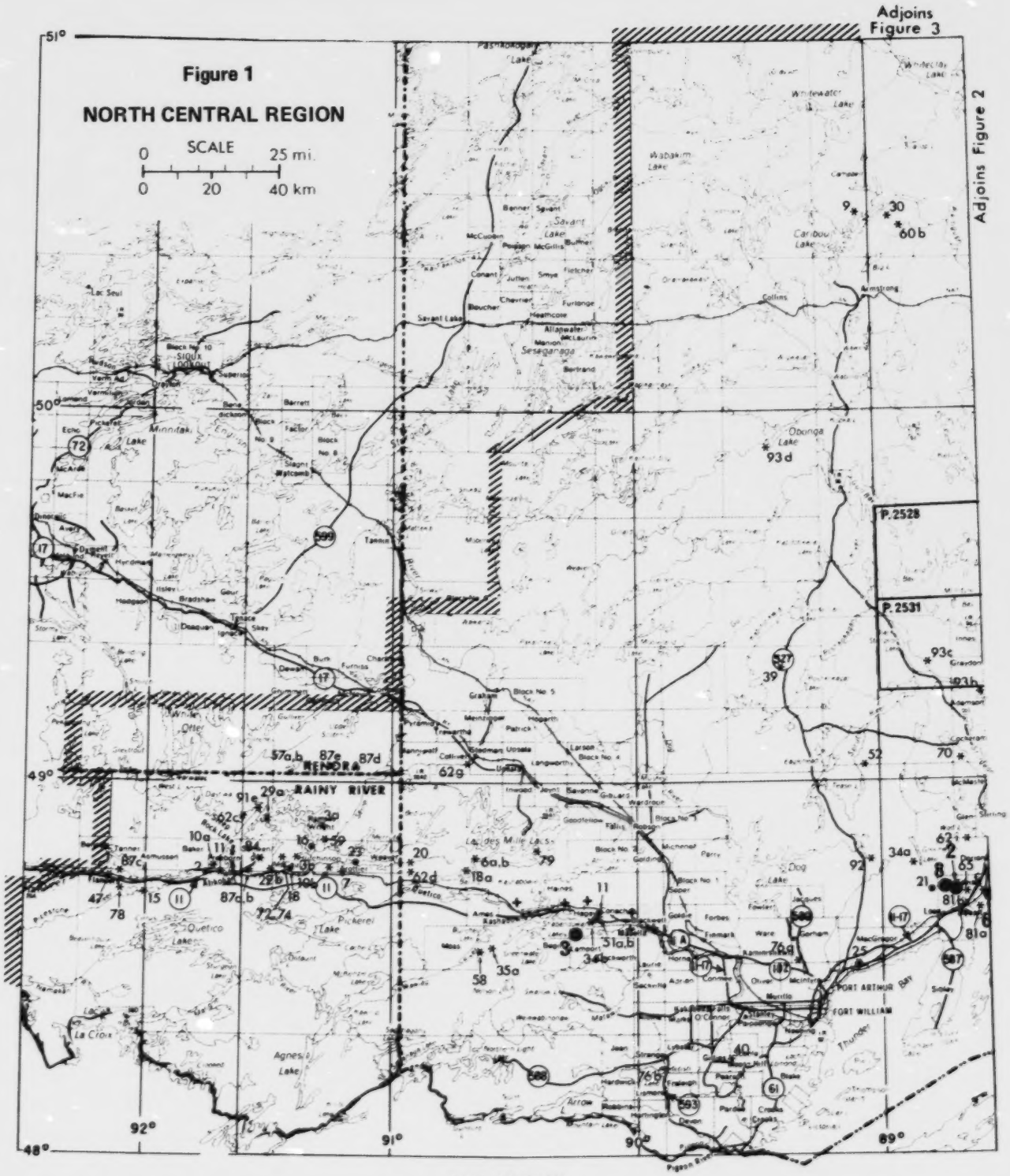
Mining Activities

Metallic Mines

The 2 major metal producers in the North Central Region are the Noranda Mines Limited (GECO Division) copper-zinc-silver mine at Manitouwadge (4)[1], and the INCO Metals Limited nickel-copper mine (3) at Shebandowan. The former was in continuous production although at a reduced rate from October 1982. The Shebandowan Mine has been closed since June due to labour problems and the depressed demand for nickel.

The Pan-Empire Joint Venture Mine received a GOMILL grant which is an interest-free, forgivable loan to aid in the building of a custom gold mill in 1982. From March to October 31, the mill had processed

[1]See Figures 1, 2, and 3 for explanation of number in parentheses.



EXPLANATION

- Map issued by the Ontario Geological Survey in 1982 (keyed to Table 6)
- P — Preliminary map
- OFR — Open File Reports 5326, 5333, 5380, 5382, 5384, 5388, and 5389 have not been plotted; the area they cover is too large to be accommodated on this map.

- Boundary of North Central Region
- Exploration activity in 1982 (keyed to Table 2)
- Assessment work filed in 1982 (keyed to Table 1)
- Major claim staking in 1982

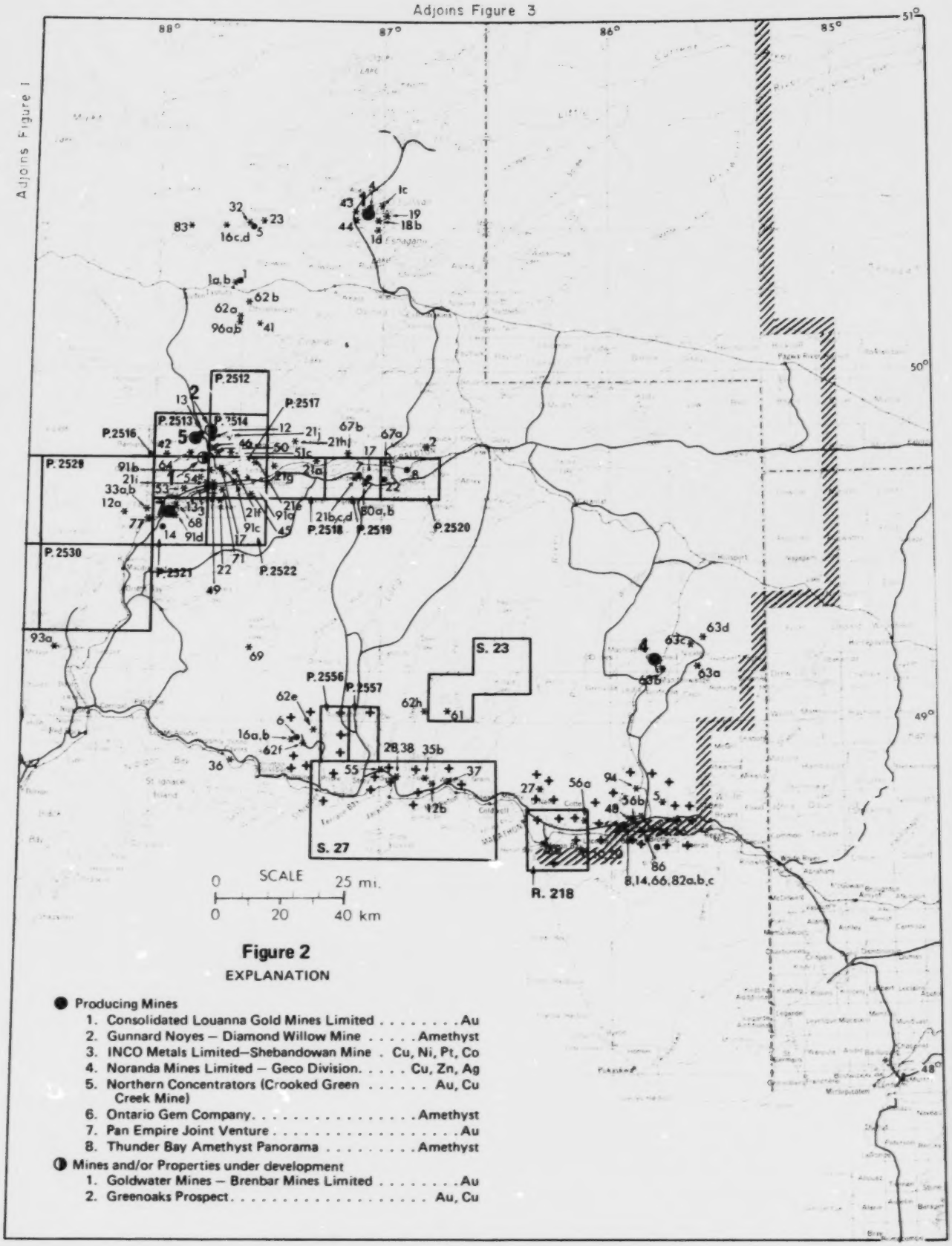


Figure 2

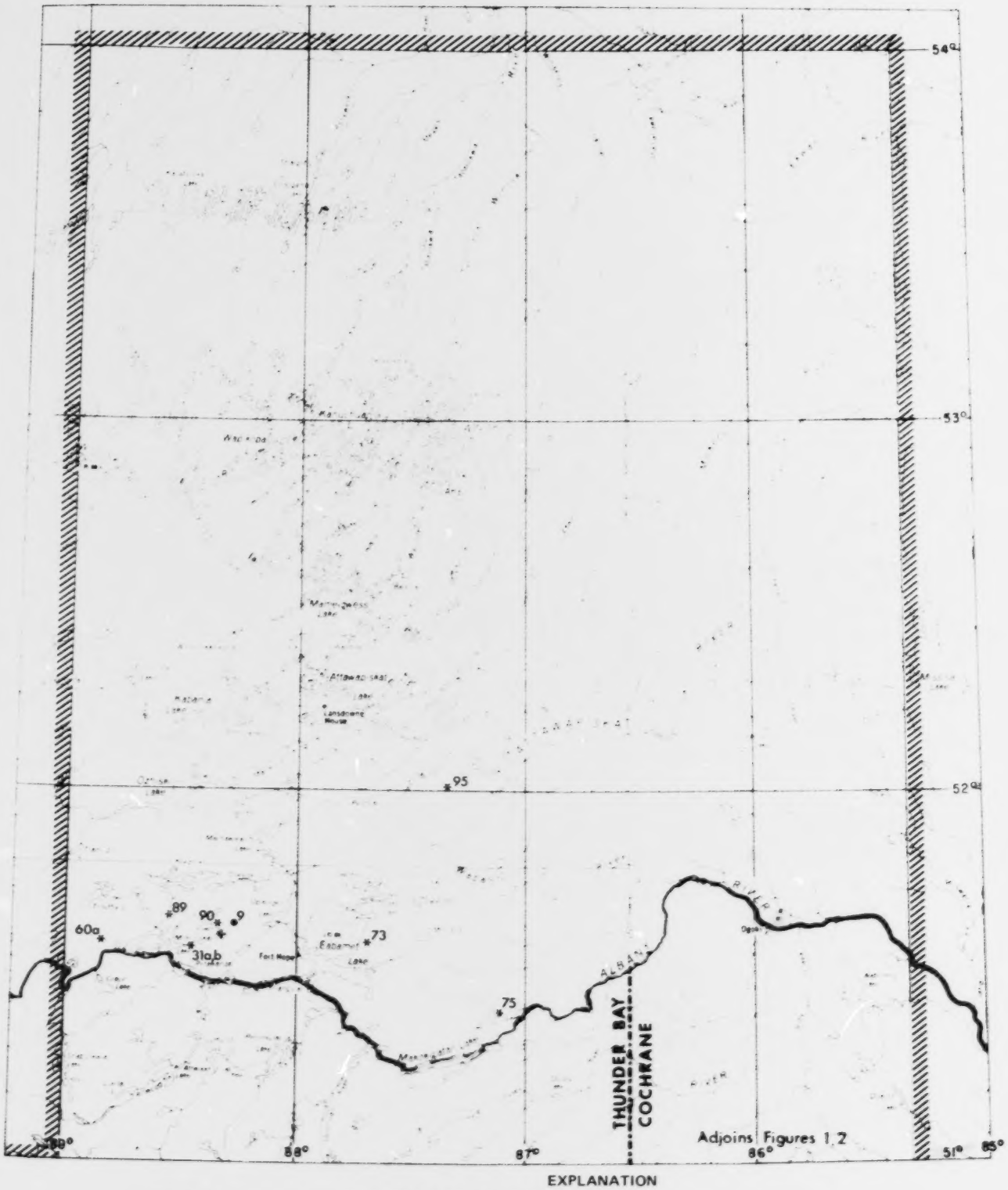
EXPLANATION

● Producing Mines

1. Consolidated Louanna Gold Mines Limited . . . . . Au
2. Gunnard Noyes – Diamond Willow Mine . . . . . Amethyst
3. INCO Metals Limited–Shebandowan Mine . Cu, Ni, Pt, Co
4. Noranda Mines Limited – Geco Division. . . . . Cu, Zn, Ag
5. Northern Concentrators (Crooked Green Creek Mine) . . . . . Au, Cu
6. Ontario Gem Company. . . . . Amethyst
7. Pan Empire Joint Venture . . . . . Au
8. Thunder Bay Amethyst Panorama . . . . . Amethyst

◑ Mines and/or Properties under development

1. Goldwater Mines – Brenbar Mines Limited . . . . . Au
2. Greenoaks Prospect. . . . . Au, Cu



EXPLANATION

Figure 3

NORTH CENTRAL REGION

SCALE
0 25 mi.
0 20 40 km

— Map or report issued by the Ontario Geological Survey in 1982 (keyed to Table 6)
- P. — Preliminary Map
- R. — Ontario Geological Survey Report
- S. — Ontario Geological Survey Study

Boundary of North Central Region
- Exploration activity in 1982 (keyed to Table 2)
- Assessment work filed in 1982 (keyed to Table 1)
- Major claim staking in 1982

TABLE 1 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

AEM-Airborne Electromagnetic Survey
A Mag-Airborne Magnetic Survey
Assay-Assay Results
Assess-Assessment Work
Non-Assess-Non-Assessment Work Data
BS-Beneficiation Studies
DD-Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled, respectively)
EM-Ground Electromagnetic Survey
Geochem-Geochemical Survey
GL-Geological Survey
IP-Induced Polarization Survey
Mag-Ground Magnetic Survey
Man Work-Manual Work
Mech Work-Mechanical Work
Min-Mineralogical Studies
Pet-Petrographic Studies
Pros-Company Prospectus
Rad-Radiometric Survey
Samp-Bulk Sampling
VLF-Very Low Frequency (EM-16) Survey

Ag-Silver
Amy-Amethyst
Apatite-Apatite
Au-Gold
Bm-Base metals (Cu, Zn, Ni)
Bst-Building Stone
Cb-Columbium
Cu-Copper
Fe-Iron
Feld-Feldspar
Li-Lithium
Marl-Marl
Mo-Molybdenum
Ni-Nickel
Sb-Antimony
Ta-Tantalum
U-Uranium
Z-Zinc

Location	NTS		File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Metcalfe Lake Area (G-84)	42L4/NE	1a.	Amax of Canada Ltd.	Au, Bm	Assess	DD 21-2242 m	1981	-	-
Metcalfe Lake Area (G-84)	42L4/NE	1b.	Amax of Canada Ltd.	Au, Bm	Assess	DD 3-860.7 m	1982	-	-
Maun Lake Area (G-319), O'Sullivan Lake Area (G-362)	42L7/NW, 42L6/NE	1c.	Amax of Canada Ltd.	Bm	Assess	GL	1980	-	-
O'Sullivan Lake Area (G-362)	42L6/NE	1d.	Amax of Canada Ltd.	Bm	Assess	DD 1-129 m	1982	-	-
Houck Twp. (G-487), Alfred Lake & McQueston Twp. (G-189)	42E15/SW	2.	Amoco Can. Petroleum Co. Ltd.	Au, Ag	Assess	DD 7-1024 m	1981	-	-
Ramsay-Wright Twp. (G-573)	52B14/NE, SE	3a.	Asamera Inc.	Au	Assess	Mag., EM, Rad., GL	1982	-	-
McCaul Twp. & Sabawi Lake Area (G-554)	52B14/SW	3b.	Asamera Inc.	Au	Assess	Mag., EM, Rad., GL	1982	-	-
McTavish Twp. (G-675)	52A10/NE	4.	Barrett, James N.	Amy	Assess	Mech. & Man. Work	1982	-	-
Molson Lake Area (G-603), Rous Lake Area (G-611), Wabikoba Lake Area (G-620), White Lake Area (N. Part) (G-622), White Lake Area (S. Part) (G-623)	42C12/NW, NE, 42C13/SW, SE	5.	Bartley, M. W., Page, T. W.	Bm, Au, Ag	Non-Assess	GL	1957	-	-
Boot Bay Area (M2448)	52B15/SE	6a.	Bazinet, E. W., Coyne, G. H.	Bm	Assess	DD 3-100 m	1981	-	-
Boot Bay Area (M2448)	52B15/SE	6b.	Bazinet, E. W.	Bm	Assess	DD 3-127 m	1982	-	-
Crooked Pine Lake Area and Trottier Twp. (G-519), Hutchinson Twp. (G-571)	52B14/SE, SW	7.	Beth-Canada Mining Co.	Cu, Ni	Assess	EM	1979	-	-
Molson Lake Area (G-603)	42C12/NW	8.	Bridge Resources Ltd.	Au	Assess	Mag., VLF	1982	-	-
Caribou River Area (G-20)	52I11/SE	9.	Bulora Corp. Ltd.	Cu, Au, Ag	Non-Assess	GL., Assay	1966	-	-
Freeborn Twp. (G-570)	52B13/SE	10a.	Camflo Mines Ltd.	Au, Ag	Assess	DD 4-704 m	1982	-	-
Hutchinson Twp. (G-571)	52B14/SW	10b.	Camflo Mines Ltd.	Au, Ag	Assess	DD 5-323 m, (assay)	1982	-	-
Freeborn Twp. (G-570)	52B13/SE	11.	Campbell, J.W. (Gossan Resources Ltd.)	Au	Assess	Mag.	1981	-	-
Maryjane Lake Area (G-80)	52H9/SE	12a.	Canadian Nickel Co. Ltd.	Au	Assess	DD 1-61 m	1972	-	-
Walsh Twp. (G-636), Tuuri Twp. (G-635)	42D15/SE, SW	12b.	Canadian Nickel Co. Ltd.	Cu, Zn, Au, Ag	Assess	Mag., EM, GL., DD 3-490 m	1981	-	-
Walters Twp. (G171)	42E12/NE	13.	Canady, B.	Au	Assess	Mech. Work	1982	-	-
Molson Lake Area (G-603)	42C12/NW	14.	Caulfield Resources Ltd.	Au	Assess	EM, Mag.	1982	-	-
Factor Lake Area (G-527)	52C9/NE	15.	Clark, M. L.	Au	Assess	DD 1-31 m	1981	-	-

TABLE 1 Continued

Location	NTS		File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Pays Plat Lake Area (G-606)	42D14/NW	16a.	Corp. Falconbridge Copper	Bm	Assess	DD 4- 777.8 m, assay	1981	-	-
Pays Plat Lake Area (G-606)	42D14/NW	16b.	Corp. Falconbridge Copper	Bm	Assess	DD 1-661.7 m, EM, Mag.	1982	-	-
Summit Lake Area (G-136)	42L5/NE	16c.	Corp. Falconbridge Copper	Bm	Assess	Geochem., AEM, (A)Mag., Mag., EM	1981	-	-
Summit Lake Area (G-136)	42L5/NE	16d.	Corp. Falconbridge Copper	Bm	Assess	DD 4-1038 m	1982	-	-
Walters Twp. (G-171)	42E12/NW	17.	Cox, N.	Au	Assess	DD 2-124 m	1982	-	-
Boot Bay Area (M-2448)	52B15/SE	18a.	Coyne, G. H.	Mo	Assess	GL	1980	-	-
O'Sullivan Lake Area (G-362), Maun Lake Area (G-319)	42L6/NE, 42L7/NW	18b.	Coyne, G. H., Bazinet, E.W.	Cu, Ag, Au	Assess	GL	1981	-	-
Maun Lake Area (G-319)	42L7/NW	19.	Culhane, P.	Au	Assess	DD 4-158 m	1982	-	-
Bedivere Lake Area (G-511)	52B15/SW	20.	Davidson, B. R.	Bm	Assess	EM	1982	-	-
Colter Twp. (M1679)	42E11/NE, NW	21a.	Dome Explor. (Can.) Ltd.	Au	Assess	DD 5-593 m	1981	-	-
Lindsley Twp. (G-483)	42E11/NE	21b.	Dome Explor. (Can.) Ltd.	Au	Assess	Mag.	1980	-	-
Lindsley Twp. (G-483)	42E11/NE	21c.	Dome Explor. (Can.) Ltd.	Au	Assess	DD 14-2006 m, mag.	1981	-	-
Lindsley Twp. (G-483)	42E11/NE	21d.	Dome Explor. (Can.) Ltd.	Au	Assess	DD 1-180 m, Mag.	1981	-	-
Walters Twp., (G-171), Leduc Twp. (G-169)	42E12/NE, 42E11/NW	21e.	Dome Explor. (Can.) Ltd.	Au	Assess	Mag., E.M.	1980	-	-
Walters Twp. (G-171), Leduc Twp. (G-169)	42E12/NE, 42E11/NW	21f.	Dome Explor. (Can.) Ltd.	Au	Assess	DD 3-422 m	1982	-	-
Leduc Twp. (G-169), Legault Twp. (G-170)	42E12/NE, 42E11/NW	21g.	Dome Explor. (Can.) Ltd.	Au	Assess	DD 5-366 m, Mag., EM	1980	-	-
Lapierre Lake Area (G-65)	42E14/SW	21h.	Dome Explor. (Can.) Ltd.	Bm, Au	Assess	DD 3-220 m, EM, Mag.	1980	-	-
Irwin Twp. (G-164), Walters Twp. (G-171)	42E12/NW, NE	21i.	Dome Explor. (Can.) Ltd.	Bm	Assess	Mag., EM	1980	-	-
Elmhirst Twp. (G-162), Rickaby Twp. (G-161)	42E13/SW	21j.	Dome Explor. (Can.) Ltd.	Au	Assess	EM, Mag.	1980	-	-
Vincent Twp. (G-163)	42E12/SE	22.	Douglas, G.B.	Au	Assess	EM	1982	-	-
Summit Lake Area (G-136)	42L5/NE	23.	Dungarvon Resources Ltd.	Bm, Au, Ag	Assess	Geochem., GL., AEM, (A)Mag.	1981	-	-
Molson Lake Area (G-603)	42C12/NW, NE	24.	Eagle River Mines Ltd.	Au	Assess	VLF, Mag.	1982	-	-
MacGregor Twp. (G-672)	52A11/SE	25.	Ellis, M.	Amy	Assess	Mech. and Man. Work	1981	-	-
Molson Lake Area (G-603)	42C12/NW, NE	26.	Enterprise Development Corp.	Au	Assess	Mag., EM	1982	-	-
Seeley Lake Area (G-613)	42D16/SW	27.	Falconbridge Nickel Mines Ltd.	Bm	Non-Assess	DD 3-396 m	1963	-	-
Syine Twp. (G-634)	42D15/SW, 42D14/SE	28.	Ferguson, A.	Au	Assess	Man. Work	1982	-	-
Finlayson Lake Area (G-528)	52B13/NE	29a.	Fern Elizabeth Gold Explor.	Au	Assess	DD 1-55 m, Man. and Mech. Work	1981	-	-

TABLE 1 Continued

Location	NTS		File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Schwenger Twp. (G-574)	52B13/SE	29b.	Fern Elizabeth Gold Explor.	Au	Assess	Mech. and Man. Work	1982	-	-
Linklater Lake Area (G-69)	52I10/SW	30.	Forbes, J. H.	Au	Assess	DD 6-172 m	1981	-	-
Frond Lake Area (G-252)	52P9/SW	31a.	Gallion Resources Ltd.	Au	Assess	EM, Mag., VLF	1981	-	-
Frond Lake Area (G-252), Miminiska Lake Area (G-332)	52P9/SW, NW, NE	31b.	Gallion Resources Ltd.	Au	Non-Assess	Pros.	1982	-	-
Summit Lake Area (G-136)	42L5/NE	32.	Giant Gripp Mines Ltd. (Corp. Falc. Copper)	Bm	Assess	EM, Mag.	1981	-	-
Summers Twp. (G-165), Mary Jane Lake Area (G-80)	52H9/SE, NE, 42E12/SW	33a.	Gold Fields Canadian Mining Ltd.	Au, Ag	Assess	EM, Mag.	1981	-	-
Summers Twp. (G-165)	52H9/SE, NE, 42E12/SW	33b.	Gold Fields Canadian Mining Ltd.	Au	Assess	DD	1982	-	-
Greenwich Lake Area (M2621)	52A15/SW	34a.	Greenwich Lake Explor. Ltd.	U	Assess	DD 1-123 m, Man. Work	1982	-	-
Hagey Twp. (G-661)	52B4/NE	34b.	Greenwich Lake Explor. Ltd.	Au	Assess	DD 1-127 m, I.P.	1982	-	-
Burchell Lake Area (M2846)	52B10/SE	35a.	Gulf Minerals Can. Ltd.	Cu, Au, Ag	Assess	DD 5-1341 m	1981	-	-
Tuuri Twp. (G-635)	42D15/SW	35b.	Gulf Minerals Can. Ltd.	Bm, Ag	Assess	DD 13-1528.8 m	1981	-	-
Middle Fox Lake and Yesno Twp. (G-85)	42D13/NE	36.	Halonen, L.	Au	Assess	Man. and Mech. Work	1982	-	-
Walsh Twp. (G-636)	42D15/SE	37.	Halonen, V.	Au	Assess	Man. and Mech. Work	1982	-	-
Syine Twp. (G-634)	42D15/SW, 42D14/SE	38.	Hamel, J. R.	Au	Assess	Man. and Mech. Work	1982	-	-
Wahkon Lake Area (M2906)	52H6/SW	39.	Hayne, W.	Bm	Assess	Man. Work	1982	-	-
Gillies Twp. (G-657)	52A5/SE	40.	Haywood, J.	Cu, Ni	Non-Assess	Assay	1969	-	-
Okoshkegan Twp. (G-173)	42L4/NE	41.	Hollinger Argus Ltd.	Au, Bm	Assess	DD 3-461 m	1981	-	-
Tyrol Lake Area (G-141)	42E13/SW	42.	Holm, H.	Au	Assess	Man. and Mech. Work	1982	-	-
O'Sullivan Lake Area (G-362)	42L6/NE	43.	Hurd, D.	Bm	Non-Assess	DD 3-74 m	1955	-	-
O'Sullivan Lake Area (G-362)	42L6/NE	44.	Jonsmith Mines Ltd.	Cu	Non-Assess	DD 14-1130 m, EM, Mag.	1959	-	-
Clist Lake Area (G-24)	42E12/NE	45.	Keevil Mining Group	Bm, Au	Non-Assess	GL	1962	-	-
Elmhirst Twp. (G-162)	42E13/SE	46.	Kengate Resources Ltd.	Bm, Au, Ag	Assess	DD 17-805 m	1982	-	-
Factor Lake Area (G-527)	52C9/NE	47.	Kroocmo, D., Murray, W. S.	Au, Bm	Assess	Mech. Work	1982	-	-
Molson Lake Area (G-603)	42C10/NW	48.	Longlac Mineral Explor. Ltd.	Au	Assess	Mag., VLF	1981	-	-
Vincent Twp. (G-163)	42E12/SE	49.	Maki, N. R.	Au	Assess	Man. and Mech. Work, DD 1 - 20 m	1982	-	-
Elmhirst Twp. (G-162)	42E13/SE	50.	Maruska, E.	Au	Assess	Assay, DD	1982	-	-
Conacher Twp. (G-646), Hagey Twp. (G-661)	52B9/SE, NE	51a.	Mattagami Lake Exploration Ltd.	Bm, Au, Ag	Assess	GL	1981	-	-

TABLE 1 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Conacher Twp. (G-646), Hagey Twp. (G-661)	52B9/SE, NE	51b. Mattagami Lake Exploration Ltd.	Bm, Au, Ag	Assess	DD 4-466 m	1982	-	-
Kaby Lake Area (G-59)	42E13/SE	51c. Mattagami Lake Exploration Ltd.	Au	Assess	DD 2-185 m	1982	-	-
Eaglehead Lake Area (M2639)	52H3/SE	52. McAteer, W.	Bst.	Assess	Assay, Man. and Mech. Work	1982	-	-
McComber Twp. (G-166), Irwin Twp. (G-164)	42E12/NW	53. McLeod, D.	Au	Non-Assess	Mech. and Man. Work	1969	-	-
Irwin Twp. (G-164)	42E12/NW	54. Metalore Resources Ltd.	Au	Assess	DD 2-339 m	1981	-	-
Syine Twp. (G-634)	42D15/SW, 42D14/SE	55. Micham Exploration Inc.	Au	Assess	EM, Mag.	1982	-	-
Molson Lake Area (G-603), Rous Lake Area (G-611)	42C12/NW, NE	56a. Mid-Canada Exploration Services Ltd.	Au	Assess	Mag., VLF	1982	-	-
Wabikoba Lake Area (G-620)	42C13/SW	56b. Mid-Canada Exploration Services Ltd.	Au	Assess	EM, Mag.	1982	-	-
Norway Lake Area (G-545)	52G3/SW	57a. Mining North Explor. Ltd.	Bm	Assess	VLF, Mag., GL, Geochem.	1982	-	-
Norway Lake Area (G545)	52G3/SW	57b. Mining North Explor. Ltd.	Bm	Assess	Mag., VLF	1982	-	-
Moss Twp. (G676)	52B10/SE, SW	58. Mountainview Explorations Inc.	Bm	Assess	DD 1-244 m	1982	-	-
Ramsay-Wright Twp. (G-573)	52B14/SW, SE	59. Nahanni Mines Ltd.	Au	Assess	DD 11-1429 m	1982	-	-
Snowdrift Lake Area (G-402), Miminiska Lake Area (G-332), Nesting Lake Area (G-342)	52P10/NE, SE, SW	60a. New Jersey Zinc Explor. Co. (Can.) Ltd.	Au, Ag, Sb	Assess	DD 56-7411 m	1980	-	-
Linklater Lake Area (G-69)	52I10/SW	60b. New Jersey Zinc Explor. Co. (Can.) Ltd.	Cu	Assess	DD 8-945 m	1982	-	-
Killala Lake Area (G596)	42E2/SE	61. Newmont Mining Corp. of Can.	U, Cb, Cu, Ni, apatite	Non-Assess	GL, Geochem., IP, Min., DD	1969	-	-
Metcalfe Lake Area (G-84)	42L4/NE	62a. Noranda Explor. Co. Ltd.	Bm	Assess	GL	1981	-	-
Oboshkegan Twp. (G-173)	42L4/NE	62b. Noranda Explor. Co. Ltd.	Bm	Assess	EM	1977	-	-
Finlayson Lake Area (G-528), Miranda Lake Area (G-543)	52B13/NW, SE	62c. Noranda Explor. Co. Ltd.	Bm	Assess	EM, Mag.	1982	-	-
Bedivere Lake Area (G-511)	52B15/SW	62d. Noranda Explor. Co. Ltd.	Bm	Assess	EM	1982	-	-
Pays Plat Lake Area (G-606), Rope Lake Area (G-609)	42D14/NW, 42E3/SW	62e. Noranda Explor. Co. Ltd.	Au, Ag, Bm	Assess	VLF, IP, Mag., Assay	1981	-	-
Pays Plat Lake Area (G-606), Rope Lake Area (G-609)	42D14/NW, 42E3/SW	62f. Noranda Explor. Co. Ltd.	Bm	Assess	Geochem., GL	1981	-	-
Hay Lake Area (M1896)	52G2/SE	62g. Noranda Explor. Co. Ltd.	Bm, Au, Ag	Assess	BS	1981	-	-
Cairngorm Lake Area (G-585)	42E2/SW, SE	62h. Noranda Explor. Co. Ltd.	Bm	Assess	Geochem., GL	1980	-	-
Dorion Twp. (G-651), Wolf Lake Area (G-160)	52A15/SE, NE	62i. Noranda Explor. Co. Ltd.	Au, Ag	Assess	IP	1981	-	-
Loken Lake Area (G-597), Foch Lake Area (G-591)	42F4/NE	63a. Noranda Mines Ltd.	Bm	Assess	GL	1981	-	-

TABLE 1 Continued

Location	NTS		File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Manitouwadge Lake Area (G-600)	42F4/NW	63b.	Noranda Mines Ltd.	Au, Bm	Assess	DD 1-1430 m, Mag.	1981	-	-
Loken Lake Area (G-597)	42F4/NE	63c.	Noranda Mines Ltd.	Bm, Au	Assess	EM, Mag.	1981	-	-
Loken Lake Area (G-597)	42F4/NE	63d.	Noranda Mines Ltd.	Bm, Au	Assess	GL, EM	1981	-	-
Tyrol Lake Area (G-141)	42E13/SW	64.	Northern Concentrators (Sol Cowan)	Au	Assess	Man. and Mech. Work	1982	-	-
McTavish Twp. (G-675)	52A10/NE	65.	Noyes, G.	Amy	Assess	Mech. and Man. Work	1982	-	-
Molson Lake Area (G-603)	42C12/NW, NE	66.	Ollmann-Williams	Au	Non-Assess	GL	1947	-	-
Errington Twp. (G-479)	42E11/NE	67a.	Oster, J.	Au	Assess	Mech. and Man. Work, DD 2-52 m	1982	-	-
Treptow Lake and Kirby Twp. (G-434)	42E14/SE	67b.	Oster, J.	Zn	Assess	Mech. and Man. Work	1982	-	-
McComber Twp. (G-166), Summers Twp. (G-165)	42E12/SW, SE	68.	Pancontinental Mining (Can.) Ltd.	Au	Assess	AEM, (A)Mag., Mag., GL	1981	-	-
Kabamichigama Lake Area (G-58)	42E4/NE	69.	Patterson, R.	Amy	Assess	Mech. and Man. Work	1982	-	-
Cockeram Twp. (G-184)	52H2/SE	70.	Peterson, W.	Marl	Assess	Mech. Work	1982	-	-
Vincent Twp. (G-163)	42E12/SE	71.	Pichette, G.	Au	Assess	Mech. Work	1982	-	-
Sabawi Lake and McCaul Twp. (G-554)	52B14/SW	72.	Placer Development Ltd.	Au	Assess	VLF, Mag., GL	1981	-	-
Veekay Lake Area (G-440)	42M12/SE	73.	Pricemore Resources Inc.	Bm, Au	Assess	DD 26-1985 m	1982	-	-
Sabawi Lake and McCaul Twp. (G-554)	52B14/SW	74.	Quetico Explor. & Devel. Co. Ltd.	Au	Assess	DD 13-1303 m	1981	-	-
Washi Lake Area (G-448)	42M6/NE	75.	R.D.P. Canadian Joint Venture	Bm, Au	Non-Assess	AEM, EM, Mag.	1970	-	-
Gorham Twp. (G-660)	52A11/SE, SW	76a.	Redden, J. W.	Au	Assess	VLF, Mag.	1980	-	-
Lybster Twp. (M1800)	52A4/NW	76b.	Redden, J. W.	Bm	Assess	VLF	1981	-	-
Summers Twp. (G-165), Maryjane Lake Area (G-80)	42E12/NW, SW	77.	Rentz, E.	Au	Assess	EM, Mag.	1981	-	-
Factor Lake Area (G-527)	52C9/NE	78.	Rich, A.	Au	Assess	DD 2-121 m	1981	-	-
Henderson Lake Area (M2399)	52B15/SE, 52B16/SW	79.	Riocanex Inc.	Bm	Assess	DD 3-1092 m	1982	-	-
Errington Twp. (G-479)	42E11/NE	80a.	Roxmark Mines Ltd.	Au	Assess	VLF, DD 3-992 m	1981	-	-
Errington Twp. (G-479)	42E11/NE	80b.	Roxmark Mines Ltd.	Au	Assess	VLF, Mag.	1982	-	-
McTavish Twp. (G-675)	52A10/NE	81a.	Saarberg Interplan Canada Ltd.	U	Assess	GL, Geochem., EM	1982	-	-
McTavish Twp. (G-675)	52A10/NE	81b.	Saarberg Inter-plan Canada Ltd.	U	Assess	GL, EM	1982	-	-
Molson Lake Area (G-603)	42C12/NW, NE	82a.	Schiralli, R. A.	Au	Assess	Mag.	1981	-	-
Molson Lake Area (G-603)	42C12/NW, NE	82b.	Schiralli, R. A.	Au	Assess	GL, EM, Mag.	1982	-	-

TABLE 1 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Molson Lake Area (G-603), Rous Lake Area (G-611)	42C12/NW, NE	82c. Schiralli, R. A.	Au	Assess	Mech. Work, Mag.	1982	-	-
Junior Lake Area (G-57)	42L5/NW	83. Selco Inc.	Bm	Assess	DD 1-82 m	1982	-	-
Schwenger Twp. (G-574)	52B13/SE	84. Sherritt-Gordon	Fe	Non-Assess	DD, assay	1943	-	-
Sibley Twp. (M1890)	52A7/SW	85. Silver Islet Mining & Lands Co.	Ag	Non-Assess	Pros.	1879	-	-
Molson Lake Area (G-603)	42C12/NW, NE	86. Snelgrove, S. C.	Au	Assess	EM, Mag., DD	1981	-	-
Schwenger Twp. (G-574)	52B13/SE	87a. Steep Rock Iron Mines Ltd.	Au	Assess	EM, Mag.	1981	-	-
Schwenger Twp. (G-574)	52B13/SE	87b. Steep Rock Iron Mines Ltd.	Au	Assess	VLF, Mag.	1982	-	-
Hepburn Lake Area (G-532)	52C16/SE	87c. Steep Rock Iron Mines Ltd.	Bm, Au	Assess	Mag., EM	1982	-	-
Richardson Lake Area (G-553)	52G3/SE	87d. Steep Rock Iron Mines Ltd.	Bm, Au	Assess	EM, Mag.	1982	-	-
Norway Lake Area (G-545)	52G3/SW	87e. Steep Rock Iron Mines Ltd.	Bm, Au	Assess	EM, Mag.	1982	-	-
Pic Twp. (G-630)	42D9/NW	88. Stenlund, V.	Au	Assess	Mech. Work, DD 3-192 m	1982	-	-
Nesting Lake Area (G-342)	52P10/NE	89. Szetu, S. S.	Au	Assess	EM, Mag., Mech. Work	1982	-	-
Frond Lake Area (G-252), Ferguson Lake Area (G-249), Opikeigan Lake Area (G-361)	52P9/NW, NE, SW	90. Tantalum Mining Corp. of Can. Ltd.	Ta, Li	Assess	EM, Mag., DD 10 - 1248 m	1982	-	-
Leduc Twp. (G-169)	42E12/NE	91a. Thorsteinson, D.	Au	Assess	GL	1982	-	-
Walters Twp. (G-171)	42E12/NE	91b. Thorsteinson, D.	Au	Assess	DD 3-134 m	1982	-	-
Walters Twp. (G171)	42E12/NE	91c. Thorsteinson, D.	Au	Assess	Mech. Work	1982	-	-
Summers Twp. (G-165)	42E12/NW, SW	91d. Thorsteinson, D.	Au	Assess	DD 2-215 m	1982	-	-
Finlayson Lake Area (G-528)	52B13/NE	91e. Thorsteinson, D.	Cu, Ni	Non-Assess	Mech. Work	1966	-	-
Hicks Lake Area (M2638)	52A14/SE	92. Thunderbrick Ltd.	Feld.	Assess.	Mech. Work, Samp.	1981	-	-
Area North of Purdom Twp. (G-97)	52H1/NW, 52H8/SW	93a. Uranerz Explor. & Mining Ltd.	U	Assess	Man. and Mech. Work	1982	-	-
Adamson Twp. + Sprout Lake Area (G-133), Graydon Twp. (G-178)	52H2/NE, 52H7/SE	93b. Uranerz Explor. & Mining Ltd.	Bm, U	Assess	AEM, (A)Mag.	1981	-	-
Mikinak Lake Area (G-87)	52H7/SW	93c. Uranerz Explor. & Mining Ltd.	U	Assess	Rad., VLF, Mag., GL, Geochem., Man. and Mech. Work	1982	-	-
Obonga Lake Area (G-100)	52H14/NW	93d. Uranerz Explor. & Mining Ltd.	Bm, U	Assess	AEM, (A)Mag.	1981	-	-
Wabikoba Lake Area (G-620)	42C12/NW	94. Vulcan Resources Ltd.	Au	Non-Assess	Pros.	1982	-	-
Norton Lake Area (G-355), East of Norton Lake Area (G-237)	42M14/NE, NW	95. Wasabi Resources Ltd.	Au, Ag Bm	Assess	DD 60-7162.45 m	1981	-	-

TABLE 1 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Metcalfe Lake Area (G-84)	42L4/NE	96a. Yzerdraat, W.	Au, Ag, Cu	Assess	GL, Rad., VLF	1981	-	-
Metcalfe Lake Area (G-84)	42L4/NE	96b. Yzerdraat, W.	Au, Ag, Cu	Assess	Mag., Rad., VLF	1982	-	-

32 800 tons of ore from the Northern Empire Mine dump (7), and 1159 tons of custom ore (E. Davis, Mining Engineer, Pan-Empire Joint Venture, personal communication, 1982). Northern Concentrators' custom mill in Thunder Bay received 800 tons of ore from the Crooked Green Creek Mine (5) in Pifher Township (B. Doucet, Manager, Northern Concentrators' Mill, Thunder Bay, personal communication, 1982). The Greenoaks Prospect (2) in Pifher Township mined 1400 tons of ore (B. Miron, Thunder Bay, personal communication, 1982). Consolidated Louanna Gold Mines Limited (1) at O'Sullivan Lake, opened in February of 1982, processing 6534 tons of ore (T. Graham, President, Graham Mining Limited, Toronto, personal communication, 1982).

Q.C. Explorations Limited plans to set up a portamill in Thunder Bay to process dredged dump material from the old Silver Islet Mine. Currently, 10 000 tons of muck are stockpiled in Thunder Bay (T. Gledhill, Engineer, Q.C. Explorations Limited, Toronto, personal communication, 1982). Teck Corporation Limited is studying the possibility of heap leaching the dump material at the Leitch Mine near Beardmore.

Industrial Minerals

Most of the amethyst production came from operations in McTavish Township, northeast of Thunder Bay; these include the deposits of Gunnard Noyes (2), the Ontario Gem Company (6), and Thunder Bay Amethyst Mining Panorama (8).

Claim Staking Activity

The total number of claims staked in the North Central Region was 9183 (to November 30), which represents a 35.7% increase over the 6768 claims staked in 1981. The number of active claims as of November stood at 18 275. A summary of staking activity in the region as far back as 1971 is shown in Table 3.

Much of the increased staking activity can be attributed to the discoveries at Hemlo by International Corona Resources Limited, and at Winston Lake by Corporation Falconbridge Copper Limited. This year, approximately 4300 claims have been staked in the Hemlo area and 3500 claims along the northern shore of Lake Superior from Schreiber to Middleton. Significant staking has occurred in the Onaman Lake area northeast of Beardmore, the Fort Hope area, and the Shebandowan Lake area.

Exploration Activity

Despite the weakening of the price of base metals, gold, and uranium in the world market, there has been an overall increase in exploration activity in the North Central Region. This is not only reflected in the staking, but in the high number of assessment credits (Table 3). The main areas of exploration have been the Hemlo area, the Beardmore-Geraldton area, the Shebandowan Lakes area, the Fort Hope area, and the Schreiber to Middleton area.

Hemlo Area

Introduction

The Hemlo area is located 35 km east of Marathon adjacent to the Trans-Canada Highway 17, 4 km west of the Manitouwadge Highway 614. Explorations for precious metals commenced in 1872 near Heron Bay (McKellar 1874). In the 1940s and 1950s, exploration began on the Ollman-Williams claims (currently a Long Lac Exploration Limited option), and the adjacent Lake Superior Mining Corporation Limited claims (currently owned by International Corona Resources Limited). Work by Teck-Hughes Limited in 1951 on the Lake Superior Mining Corporation Limited claims outlined a deposit containing 150 000 tons of 0.21 ounce gold per ton (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). In 1981, International Corona Resources Limited announced the discovery of a significant deposit. This spurred the staking of approximately 7000 claims; 4300 claims in the North Central Region, and 2700 claims in the Northeastern Region.

Active exploration programs in the area are being carried out by 40 to 50 companies. Some of these companies include: International Corona Resources Limited, Golden Sceptre Mines Limited, Goliath Gold Mines Limited, Teck Corporation Limited, Noranda Exploration Company, Bel-Air Resources Limited, Long Lac Mineral Exploration Limited, Interlake Development Corporation Limited, and Harlin Resources Limited.

General Geology

The area has been mapped by the Ontario Geological Survey. The reader is referred to works by; Thomson (1931), Milne (1968), and Muir (1982a, 1982b). This

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1.	Amax Exploration Incorporated	Drilling on Tashota Gold Property.
2.	Camflo Mines Limited	Drilling on Elizabeth Mine Property, Atikokan.
3.	E. Canady	Stripping and Trenching, on Wenzoski Gold Property, Walters Township.
4.	Consolidated Louanna Gold Mines Limited	Drilling; O'Sullivan Lake Property.
5.	Corporation Falconbridge Copper	Geology, Geophysics, Geochemistry, Drilling; Marshall Lake Area.
6.	Corporation Falconbridge Copper	Mapping, Stripping, Geochemistry, Down Hole Geophysics, Drilling; Zenith Zinc Mine, Schreiber Area.
7.	Dome Exploration Limited	Geophysics, Drilling on Key Lake Option, Near Jellicoe Mine, Geraldton Area.
8.	Hollinger Argus Limited	Linecutting, Magnetometer Survey, Diamond Drilling, Hol-Lac Property, Geraldton.
9.	Keezic Resources Limited	Humic Gold Survey, Diamond Drilling, Frond Lake Property, Fort Hope Area.
10.	Little Longlac Exploration Limited	Stripping, Mapping, Drilling on Williams' Property, Hemlo Area.
11.	Mattagami Lake Exploration Limited	IP, Geology, Drilling on Band-Ore Property, Shebandowan Area.
12.	W. Miron	Stripping and Trenching, Greenoaks Property, Beardmore.
13.	Northern Concentrators	Stripping and Trenching; Crooked Green Creek Property, Beardmore.
14.	Pan-Empire Joint Venture	Dewatered and Sampled the Empire Mine to the 300-foot level.
15.	R. Pitkanen	Stripping, Trenching and Sampling; Olive Mine, Mine Centre.
16.	G. Rawlings	Trenching and Sampling Reserve Island Occurrence, Atikokan Area.
17.	Roxmark Mines Limited	Drilling on Magnet and McLellan Properties near Geraldton.
18.	Sherritt-Gordon Mines Limited	Mill Study, Atiko Gold Mines Limited, Atikokan Area.
19.	Sherritt-Gordon Mines Limited	Trenching, Geological Mapping and Sampling of Manhattan, Ferguson and Foley Property, Mine Centre Area.
20.	Teck Corporation Limited	Drilling on International Corona Resources Property, Hemlo Area.
21.	Thunder Bay Panarama Amethyst Mine	Stripping and Trenching.
22.	Tombill Mines Limited	Drilling Talmora Mine Property, Geraldton.
23.	White Lily Gold Mines	Stripping, Trenching and Sampling White Lily Occurrence, Atikokan.

SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

TABLE 3

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)	Total Man Days.
1971	4,627	5,211	9,833	63,744.25	53,028	7,456	131,962.72
1972	3,442	5,091	8,184	61,512.2	53,757.5	4,776	131,393
1973	2,253	5,515	4,922	49,575	24,320	7,450	94,308.6
1974	3,305	3,391	5,837	37,130.5	26,061	4,300	80,559.2
1975	3,436	2,869	6,404	38,652	53,020	4,700	105,338
1976	2,364	3,552	6,079	52,551.6	29,504	4,600	101,025.8
1977	1,964	2,966	5,077	24,879	25,601	4,870	68,727
1978	3,517	1,982	6,612	20,182	20,589	6,206	51,299
1979	3,099	2,139	7,554	11,528	69,612	14,727	101,799
1980	5,527	1,836	11,245	53,418	57,483	5,372	127,288
1981	6,768	4,162	13,851	55,256	172,366	13,863	256,686
1982 (to end of Nov.)	9,183	4,471	18,275	112,990	93,519	23,248	248,659

mapping defines a east-trending belt of Early Precambrian (Archean) metasediments and metavolcanics (a part of the Wawa Subprovince) which forms a broad synform. Granitic intrusions occur along the axis of the syncline. The Quetico Gneiss Belt occurs to the north, and the Pukaskwa Gneiss Complex to the south. Muir (1982a, 1982b) divided the belt into 2 main sequences near the town of Heron Bay. The northern Heron Bay sequence consists predominantly of intermediate to felsic metavolcanics and metasediments. The metavolcanics consist of flows, pyroclastic breccias, and tuffs. The coarsest pyroclastic rocks occur near Heron Bay. The pyroclastic rocks gradually become finer grained with a higher component of reworked material (tuffaceous fragments) to the east than those rocks to the west. Pelitic metasediments begin to interfinger with the tuffs and tuffaceous sediments near Hemlo. Further to the east, near Struthers, the pelitic metasediments predominate. The southern Playter Harbour Sequence consists of mafic pillowed metavolcanics (high-iron tholeiites) which have been intruded by ultramafic sills.

Property Descriptions

International Corona Resources Limited

The property is located 5 km east of the settlement of Hemlo. The property is currently under option to Teck Corporation Limited.

The geology of the deposit is described in the 1982 annual report of International Corona Resources Limited:

> The gold veins are associated within a mineralized siliceous and sericitic altered metavolcanic sediment. The zone is moderately sheared parallel to the bedding on the limb of a steeply dipping homocline 45-60 degrees north and striking 107 degrees east. The west and east zones are within the same stratigraphic horizon which has been intersected by a 250-foot wide diabase dike that did not offset the zone of mineralization. The gold is in a sulfide-pyrite ore — is evenly distributed — fine-grained and is visible in many of the cores.

Teck Corporation Limited described the dimensions of the deposit in the Northern Miner, June 17, 1982 as:

> . . . east zone- 800 feet long, drilled to 1,300 feet, and average of 10 feet wide and open to depth containing a "geological mineral reserve" estimates of 1,300,000 tons, grading 0.30 ounce per ton gold.
>
> . . . west zone- 1,200 feet long, drilled to 350 feet, an average of 20 feet wide, containing 325,000 tons of open pit reserves grading 0.095 ounces per ton gold and 213,000 tons of underground reserves grading 0.129 ounces per ton gold.

A longitudinal section published in the 1982 annual report of International Corona Resources Limited showed the east ore zone to plunge 70° to the east. The mineralization also has significant molybdenum values that may indicate the presence of ore (The Northern Miner, November 11, 1982). The molybdenum grade of the east ore zone is 0.08% MoS_2 (M. Blecha, Teck Corporation Limited, personal communication, 1982). A second mineralized horizon parallel to "the west ore zone" occurs 300 feet to the south. It was discovered by Lake Superior Mining Corporation Limited (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Long Lac Mineral Exploration Limited: (Williams Option)

The property is adjacent to the western boundary of the International Corona Resources Limited claim block, 4 km east of the settlement of Hemlo. The geology has been described by Page in 1951 (Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The property is underlain predominantly by metasediments striking east. A "Major Break" with mafic metasediments to the south and felsic metsediments to the north, occurs near Highway 17. A quartz porphyry trending at 107° occurs to the north of the break in felsic metasediments. The quartz porphyry unit is "250 feet thick in the east and 1,000 feet thick in the west". Both margins of the porphyry are sheared, silicified, and mineralized with pyrite, molybdenite, and gold. The early work conducted by J.K. Williams was carried out in the western part of the claims along the southern contact of the quartz porphyry.

The deposit diamond drilled by Long Lac Mineral Exploration Limited occurs on the eastern side of the claim block, to the east of Moose Lake and north of Highway 17. The deposit is the on strike continuation of the western zone of International Corona Resources Limited. The dimensions of the deposit are reported in The Northern Miner, August 17, 1982. The deposit has been drilled to a depth of 150 m and averages 23.7 m in width. The tonnage is estimated to be 1.8 million tonnes at 0.145 ounce gold per ton (G. Smith, Geologist, Long Lac Exploration Limited, personal communication, 1982). The deposit is open to depth, that is, the limits at depth are not proven.

Goliath Gold Mines Limited

The property surrounds the International Corona Resources Limited property on 3 sides (the east, north, and south). The property is presently optioned to Noranda Exploration Company (Globe and Mail, November 13, 1982). Exploration has been concentrated on the down dip extension of the Long Lac Mineral Exploration Limited Deposit. Diamond drilling has outlined a zone of mineralization 200 m by 170 m that averages a width of 25 m, containing 2 516 080 tons of geologically inferred ore at 0.249 ounce gold per ton (George Cross Newsletter Number 204, October 25, 1982). The mineralized zone is bounded by the Long Lac Mineral Exploration Limited Deposit to the west along strike, and to the south up dip. A second tier of diamond-drill holes has extended this zone an additional 200 m along dip (George Cross Newsletter, November 15, 1982). To the east of International Corona Resources Limited, 100 m south of Struthers, mapping has indicated the presence of molybdenite and pyrite in a sericite schist on strike with "The Corona east ore

zone" (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Golden Sceptre Resources Limited

The property extends as a band 3.2 km wide by 9.7 km to the west of International Corona Resources Limited's Property. The property was optioned to Noranda Exploration Company in November 1982. Three mineralized zones have been discovered during an exploration program which included geological mapping, trenching, an Induced Polarization survey, and soil geochemistry. One of the zones (the fracture zone) is located 800 m north of Highway 17, on the eastern boundary with Long Lac Mineral Exploration Limited. The fracture zone is "hosted" in quartz veins which cut a quartz porphyry. This zone appears to be on strike with mineralization discovered during the 1950s on the western side of Long Lac Mineral Exploration Limited's Property (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The mineralization consists of native gold, molybdenite, pyrite, and unidentified telluride minerals. Initial diamond drilling has intersected a number of high grade (up to 3.36 ounces gold per ton) zones over narrow widths (1.6 to 4.9 feet; George Cross Newletter Number 204, October 25, 1982).

The second zone is located 150 m north of the first zone. It is defined by an east-trending soil geochemical anomaly. Assays of diamond-drill core are: hole 4, 21 feet of 0.33 ounce gold per ton; and hole 19, 36 feet of 0.325 ounce gold per ton (The Northern Miner, November 18, 1982).

The third zone, the highway zone, was sampled by Muir (1982b) and assayed 0.32 ounce gold per ton. Mineralization consists of pyrite, native gold and minor molybdenite, and is hosted in volcanoclastic metasediments. The unit is up to 2 m wide and can be traced from Moose Lake to Finger Lake, a distance of 3 km. The volcanoclastic metasediment is made up of 50% fragments of feldspar porphyry, chert, and altered volcanics 2 mm to 5 cm in size, which have been stretched up to 15:1 parallel to foliation. The matrix contains sericite, green mica, and tourmaline.

Summary

The 3 deposits outlined thus far (International Corona Resources Limited, Long Lac Mineral Exploration Limited, and Goliath Gold Mines Limited) are parts of 1 large deposit. The combined published tonnage is 6 154 080 tons at 0.226 ounce gold per ton. The mineralization consisting of disseminated pyrite, gold, and molybdenite is hosted in siliceous and sericitic altered metasediments. There is a strong stratigraphic control on the position of the deposit. This horizon can be traced from the property of Golden Sceptre Resources Limited in the west, and across the properties of Long Lac Mineral Exploration Limited, International Corona Resources Limited and Goliath Gold Mines Limited, a distance of 6 km. The deposit is situated at the contact between felsic metasediments (derived from the reworking of tuffs) and pelitic metasediments. At least 2 possible origins have been suggested by workers in the area:

1. A volcanogenetic gold deposit with origins similar to the Bousquet Deposits, Quebec (Valliant and Hutchinson 1982);
2. Mineralization within a shear zone related structure (Page 1951, Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The description and metallogenesis of these deposits will be the topic of a research project carried out by the Thunder Bay Resident Geologist.

Recommendations for Exploration

The ore deposit consists of a sericite schist with minor amounts of pyrite and molybdenite. The molybdenite could easily be mistaken for graphite. If assay "pulps" or a core library have been kept, all sericite schists should be analyzed for gold. Many properties drilled for base metals have recorded in their diamond-drill logs similar sericitic schists. An example of molybdenite in a schist can be found in Dorion Township, concession XIII, lot 5. Work by New Senator-Rouyn Limited in 1965 reported MoS_2 in "quartz veins and schists". One assay returned 0.05% MoS, across 65 feet in a "schist" (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Schreiber to Middleton Area

Exploration activity in this area has concentrated on base-metal targets near the old Zenith Mine (Corporation Falconbridge Copper), 27 km northwest of Schreiber near Winston Lake, and 20 km to the east of Santoy Lake (Gulf Minerals Limited, Teck Corporation Limited, International Nickel Company Limited). Many of the small past producing mines in the Schreiber area have been staked by individual prospectors; Gold Range Mine (W. Acker), a part of North Shores Gold Mine (P. Skalesky and P. Greer). MacMillan Energy Corporation and Highmark Resources Limited have announced a joint venture on the Victoria Cape area, 5 km east of Terrace Bay. Michem Resources Limited is carrying on an exploration program near the Empress Mine, 12 km northeast of Terrace Bay.

Property Descriptions

Winston Lake Property (Zenith Mine)

Corporation Falconbridge Copper optioned the property from Zenmac Exploration Limited in 1980. The property is located 27 km northwest of Schreiber near Winston Lake. Corporation Falconbridge Copper carried out a program of geological mapping, geochemistry, diamond drilling, and down hole geophysical work. Diamond drilling has outlined a zone 500 m long. The

average grade from 6 diamond-drill intersections is 1.06% copper, 15.5% zinc, and 18.2 g silver per ton across 5.64 m (The Northern Miner, September 16, 1982). The tonnage is estimated to be 4 million tons (The Northern Miner, November 11, 1982). The geology of Zenith Mine was described by Pye (1964) and Kite (1981). The Zenith Mine orebody is interpreted to be part of a volcanogenic massive sulphide deposit which was rafted into a gabbro intrusion (Kite 1981). Mapping has shown the presence of a northward-striking belt of felsic volcanic rocks, predominantly composed of lapilli-tuff, to the west of the Zenith Mine. The current diamond-drill program is directed toward locating massive sulphides hosted in the felsic volcanic rocks.

Victoria Cape Property

The property is located 5 km east of Terrace Bay. MacMillan Energy Corporation and Highmark Resources Limited have announced a joint venture program on the property. Gold was first discovered on Victoria Cape by D. McKellar in 1875. Later work by W. Longworth outlined a vein which was stripped for 800 feet and varied in width from 18 inches to 4 feet; assays ran from $2.50 to $30.00 per ounce (1923 price of gold — $20.94) (Canadian Mining Journal, October 19, 1923).

Recommendations for Exploration

1. Staking in the Victoria Cape area resulted in part from geological data compiled by the Resident Geologist from pre-1925 journals and reports, and placed in the Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay. In connection with the Thunder Bay Historical Museum and the Mining Sector Work Program, information of this type will be included in the Thunder Bay Resident's Geologist's Files, Ontario Ministry of Natural Resources.
2. Mapping by Walker (1966) indicated a broad belt of felsic volcanic rocks to the west and south of Santoy Lake. Near the contact with a granitic pluton to the north, the felsic volcanic rocks have been subjected to contact metamorphism, and andalusite is present. Work on massive sulphide deposits by Franklin *et al.* (1975) suggest these metavolcanics may be altered, and that the geological environment may be favourable for massive sulphide deposits.

Fort Hope Area

Companies active in the area include New Jersey Zinc Exploration Company (Canada) Limited, Gallion Resources Limited, Keezic Resources Limited, La-Chib Mines Limited, Pricemore Resources Limited, Tantalum Mining Corporation of Canada Limited, Wasabi Resources Limited, and Belore Mines Limited. An access road for the pulp and paper industry from Nakina to Thurman Creek, 40 km south of Fort Hope, is currently under construction.

Gold Deposits

The gold deposits in the area can be divided into 3 types: gold-antimony veins, gold in ironstones, and gold-tungsten veins.

Gold-Antimony Veins

New Jersey Zinc Exploration Company (Canada) Limited and S. Szetu have been carrying out exploration programs on quartz-carbonate vein systems with pyrite-stibnite-gold mineralization to the west and north of Miminiska Lake. The veins occur in altered (carbonatized and silicified) mafic volcanic rocks near the contact with metasediments. A channel sample reported by (Bayne 1974, Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) on the Ymir Mining and Exploration Limited Occurrence (presently held by S. Szetu) assays 0.502 ounce gold per ton across 11 feet. New Jersey Zinc Exploration Company Limited has defined 2 zones of mineralization related to intense silicification and carbonatization, near and in a quartz porphyry intrusion. The west zone has an estimated tonnage of 83 000 tons of 1.37% antimony and 0.07 ounce gold per ton; the zone is open to depth. The east zone contains 660 000 tons of 3.1% antimony and erratic gold values; the zone is open along strike and depth (C. Idziszek, Exploration Manager, New Jersey Zinc Exploration Company (Canada) Limited, Toronto, personal communication, 1982).

Gold in Ironstone

Keezic Resources Limited and Gallion Resources Limited are working on a number of gold occurrences discovered in the 1940s between Miminiska Lake and Frond Lake, 10 km west of Fort Hope.

Pyrrhotite-arsenopyrite-gold mineralization occurs in a garnet-amphibolite schist that probably represents chert-carbonate ironstone metamorphosed to amphibolite facies. Deformation in the area resulted in the development of quartz veins within the ironstone. These veins are similar to the gold-bearing veins deposits in the Contwoyto Lake area, Northwest Territories Limited (McConnell 1964).

On the Frond Lake Property held by Keezic Resources Limited, work done by Conwest Exploration Limited in the 1940s defined 2 mineralized zones. The northern zone averages 0.39 ounce gold per ton across 5 feet for a length of 400 feet. The southern zone averages 0.25 ounce gold per ton across 6.2 feet for a length of 900 feet (The Northern Miner, October 22, 1982). Recent work by Keezic Resources Limited has extended these zones 500 feet to the east of the area drilled by Conwest Exploration Limited.

Similar arsenopyrite-bearing ironstone occurs further to the east of the claims of Gallion Resources Limited and on Crown Land open for staking (Wallace 1981).

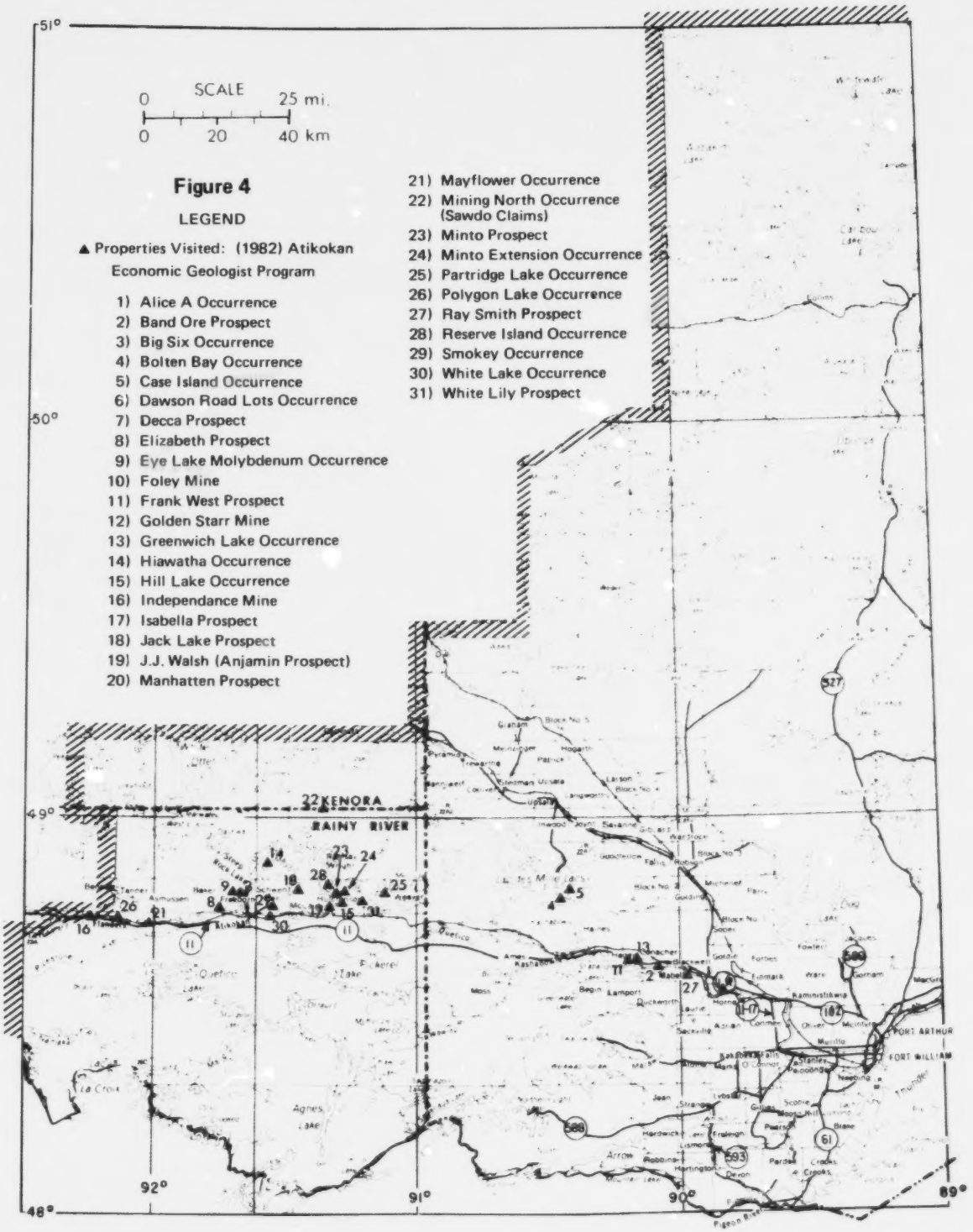


Figure 4

LEGEND

▲ Properties Visited: (1982) Atikokan Economic Geologist Program

1) Alice A Occurrence
2) Band Ore Prospect
3) Big Six Occurrence
4) Bolten Bay Occurrence
5) Case Island Occurrence
6) Dawson Road Lots Occurrence
7) Decca Prospect
8) Elizabeth Prospect
9) Eye Lake Molybdenum Occurrence
10) Foley Mine
11) Frank West Prospect
12) Golden Starr Mine
13) Greenwich Lake Occurrence
14) Hiawatha Occurrence
15) Hill Lake Occurrence
16) Independance Mine
17) Isabella Prospect
18) Jack Lake Prospect
19) J.J. Walsh (Anjamin Prospect)
20) Manhatten Prospect
21) Mayflower Occurrence
22) Mining North Occurrence (Sawdo Claims)
23) Minto Prospect
24) Minto Extension Occurrence
25) Partridge Lake Occurrence
26) Polygon Lake Occurrence
27) Ray Smith Prospect
28) Reserve Island Occurrence
29) Smokey Occurrence
30) White Lake Occurrence
31) White Lily Prospect

Gold-Tungsten Veins

Deposits of this type include the Fort Hope Gold Mine (La-Chib Mines Limited), Reserve Creek Occurrence (Pricemore Resources Limited), Rich Lake Patricia scheelite Deposit (Ken Bernier, prospector, Sioux Lookout), and the Fort Hope Reserve Deposit (Fort Hope Indian Band). The deposits occur in narrow (<1 foot) quartz veins and sheared mafic volcanic rocks. Mineralization consists of pyrite, pyrrhotite, sheelite, rare chalcopyrite, and visible gold.

Diamond drilling by Little Long Lac Mines Limited on the Fort Hope Reserve Deposit in the 1940s outlined a deposit with "an indicated tonnage of 300,000 tons to 300 feet at 0.28 ounces gold per ton" (Darling, Unpublished Report, 1962, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Pricemore Resources Limited drilled along strike to the Little Long Lac Deposit and intersected zones up to 69.6 feet long that assay 0.13 ounce gold per ton (The Northern Miner, July 22, 1982). Assays of samples collected from the Rich Lake Patricia scheelite Deposit average 0.65%WO_3 and 0.13 ounce gold per ton (Wallace 1978).

Copper-Nickel Deposits

Two companies are involved in exploration for copper-nickel deposits in the Fort Hope area: Wasabi Resources Limited at Norton Lake (48 km northeast of Fort Hope), and Belore Mines Limited at Rowlandson Lake (24 km north of Landsdowne House).

Norton Lake Deposit

Following up airborne anomalies, Wasabi Resources Limited diamond drilled a deposit 225 m long, 7.1 m wide, 175 m deep containing 1 041 130 tons grading 0.72% nickel and 0.56% copper (The Northern Miner, July 29, 1982). The deposit is open along plunge and strike. Drillhole results show the deposit to be hosted in mafic to ultramafic intrusion-cutting metasediments. Assays gave values up to 0.01 ounce platinum per ton, up to 0.01 ounce palladium per ton, and up to 40 parts per billion gold (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Rowlandson Lake Occurrence

The original work done on the property was completed in 1940 by Winisk River Mines Limited. The company's annual report published in 1941 describes diamond drill results from 1 hole on a gabbro dike as: "18 feet cf 1.74 percent copper followed by 23 feet of 0.53 to 0.83 percent copper". A chip sample taken by the author across 3 m of heavily mineralized gabbro during the 1982 field season assayed 1.40% copper, 0.15% nickel, and 0.01 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto). The pyrrhotite-chalcopyrite mineralization occurs as a net texture in a medium-grained gabbro. The property is currently held by Belore Mines Limited.

Recommendations for Exploration

The arsenopyrite-bearing ironstones reported by Wallace (1981) should be examined and prospected for their gold potential. Airborne magnetometer surveys indicate the presence of a number of other ironstones that may be host to gold deposits. Prospecting activities that use these maps as a guide may reveal further occurrences.

Beardmore-Geraldton Economic Geologist Program

Introduction

The Beardmore-Geraldton Economic Geologist Program is jointly funded by the Ontario Ministry of Northern Affairs and the Federal Department of Regional Economic Expansion under the Northern Ontario Rural Development Agreement. The object of the program is to stimulate exploration by assisting prospectors and mining companies in the Beardmore-Geraldton area with property visits, mapping, sampling and literature searches; leading field trips to "orient" new companies and other researchers in the area; documenting new mineral occurrences and new data on all mineral occurrences; and revising the Tashota-Geraldton geological compilation map (Pye *et al.*1965).

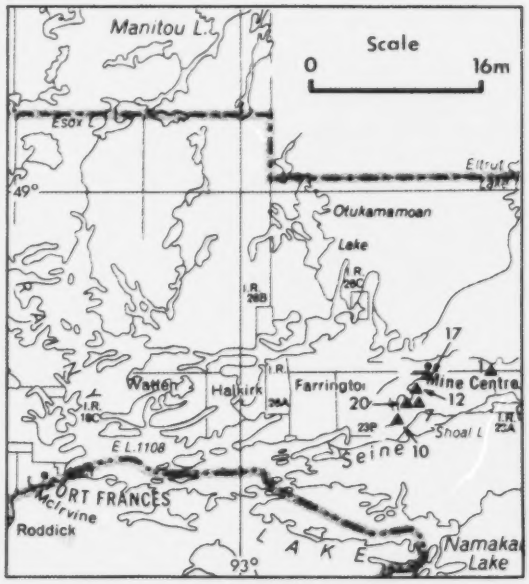


Figure 4a

TABLE 4 **Other Recently Active Properties (Beardmore-Geraldton)**

Property	Commodity	Ownership	Development	Geology Mineralization	Economic Geology
DikDik (Orphan) Mine Rickaby Twp. Type 2	Au, Ag	Rockwell Mining Corp.	1982-sampled dump 1934-35 -shaft to 262 ft. and open cut	quartz vein at contact of Kaby Lake granodiorite and intermediate metavolcanics	Production: 1934-35: 2,460 ounces gold 1,558 ounces silver
Solomon's Pillars (Oremond Prospect) Walters Twp. Leduc Twp. Type 1	Au	Lynx Canada Explor. Ltd.	1982-mapping and sampling 1936-37 -shaft to 275 ft.	oxide ironstone in metasediments	gold associated with secondary pyrite, arsenopyrite and minor chalcopyrite in primary oxide ironstone
Theresa Gold Mine Making Ground River, Longlac area Type 2	Au, Ag	L. G. Phelan R. F. Liard	3 shafts	veins in shears in quartz-diorite stock and surrounding intermediate to mafic metavolcanics; cp, po, py, bn	Production: 1935-38, 1941-43), 1945, 1950-53, 1955), 4,785 ounces gold, 202 ounces silver
Hutchinson Lake Gold Mine (Maylac Mine) Fulford Twp. Type 1	Au, Ag	Gulch Resources Ltd.	1947-shaft to 450 ft. 1937-shaft to 250 ft.	veins in shear zone in intermediate to mafic metavolcanics, py, gn, sp	Production: 1946+47: 792 ounces gold, 46 ounces silver
Talmora Gold Mine Errington Twp. Type 1	Au, Ag	Tombill Mines Ltd.	1938+39-shaft to 544 ft.	veins and lenses in shear zone near contact of diorite and wacke, py, asp	Production: 1942+48, 1,417 ounces gold, 36 ounces silver

The area has produced over 4.12 million ounces of gold. The Pan-Empire Joint Venture, Consolidated Louanna Gold Mines Limited, W. Miron (Greenoaks Prospect) and (Crooked Green Creek Mine) mined gold ore in 1982.

Properties totaling 28 in number were visited. Several were visited many times. Talks on geology were given at the Geraldton Composite High School and at the Junior Ranger camps. Numerous informal field trips were conducted for company geologists, university researchers, the Ontario Geological Survey, Geological Survey of Canada, and the Peoples Republic of China researchers.

Allan Speed, Resource Geologist, compiled and published 10 data series maps. Allan Speed also completed 21 others under the new Geological Data Folios Inventory.

General Geology of the Beardmore-Geraldton Area

The Beardmore-Geraldton area is within an east-trending isoclinally folded early Precambrian metavolcanic-metasedimentary sequence of the Wabigoon Subprovince. A unit of fine-grained metasediments (wacke, siltstone, argillite) bounded on the south by a laterally extensive mafic to intermediate metavolcanic unit (basalts, mafic tuffs) is disconformably overlain by a coarser grained metasedimentary unit in the Geraldton area, which is composed of conglomerate, wacke, argillite, ironstone (Mackasey 1970; Pye 1952). Both metasedimentary units thin to the north and are overlain by a mafic to intermediate unit in the Beardmore area (Mackasey 1975). Further north in the Onaman Lake area and up section, felsic pyroclastic rocks interfinger with coarse-grained clastic metasediments (Mackasey 1970).

The metavolcanic-metasedimentary sequence has been intruded by felsic batholiths and stocks and lenticular mafic intrusions. Late Precambrian diabase dikes and sills intrude all rock types.

Gold Exploration

Amax of Canada Limited-Bruneau Mining Corporation conducted an exploration program on their Tashota gold property, located to the north of Tashota Station (75 km north of Beardmore). The program consisted of the following: magnetometer, Induced Polarization and VLF surveys, geological mapping, and diamond drilling. Dome Exploration (Canada) Limited diamond drilled the old Jellicoe Mine Property, Lindsley Township, 11.2 km west of Geraldton. The property was optioned from Key Lake Explorations Limited. Metalore Resources Limited diamond drilled the Brookbank Gold Prospect in Irwin Township. Other properties in the Beardmore-Geraldton area are shown in Table 4.

Gold Deposits

Gold deposits in the Beardmore-Geraldton area have been divided into 3 deposit types.

(1) Southern Wabigoon Belt Vein and/or Ironstone Associated Type

Gold mineralization of this type is associated with an east-trending belt of coarse-grained clastic metasediments and mafic metavolcanics which can be traced from Beardmore to Longlac. The belt produced 98%

percent of the gold in the Beardmore-Geraldton camp. Gold mineralization is associated with shear zones, quartz veins, breccia zones, and metamorphogenic sulphides hosted in clastic metasediments, felsic intrusive rocks, gabbro intrusions, and ironstones (Horwood and Pye 1955).

Property Visits

Maki Property

The Maki Property is situated in Vincent Township, 17.0 km east-northeast of Beardmore. A number of occurrences were visited by the author. At the Moosehorn showing, a 5 m wide quartz vein, striking 85°, is hosted in mafic metavolcanics with minor magnetite-silicate ironstones. The vein is mineralized with varying amounts of galena and chalcopyrite. Selected grab samples assayed 0.02 to 0.13 ounce gold per ton and 0.52 to 3.89 ounce silver per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

The Skidder showing consists of quartz-tourmaline veins and banded magnetite-silicate-carbonate ironstone in massive. Mafic metavolcanics 9.0 m in width separate the 2 ironstone bands. Assays from the magnetite-silicate-carbonate ironstone and associated quartz-tourmaline-arsenopyrite veins give contents as high as 0.01 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

Pan-Empire Joint Venture

Pan-Empire Joint Venture, Summers Township, operated by Pancontinental Mining (Canada) Limited, commenced mill operations in March at their new 200-ton per day custom mill facility on the old Northern Empire Mine Property. Pan-Empire is processing dump material from the original Newmont Mining Corporation operation. Until October 31, 1982, 32 800 short tons grading up to 0.10 ounce gold per ton were milled (E. Davis, Mining Engineer, Pan-Empire Joint Venture, personal communication, 1982). Pancontinental Mining (Canada) Limited has been given the first provincial GOMILL (custom gold milling) award in Ontario, this award involves a forgivable loan of 1 million dollars over 5 years. Pancontinental Mining (Canada) Limited has a commitment to make the mill available for the processing of custom ore from prospectors or mining companies, 50% of the time. As of October 31, 1982, 1159 short tons of custom ore were milled (E. Davis, Mining Engineer, Pan-Empire Joint Venture, personal communication, 1982). Atomic absorption assay and fire assay analytical services are available to the public.

The first and second levels of the mine were mapped and sampled. The mineralization occurs in a wide (greater than 3.0 m) shear zone, striking 70° and dipping 80°, in mafic metavolcanics. Associated with the shear zone is a lenticular, composite quartz vein. The zone is mineralized with pyrrhotite, arsenopyrite, pyrite and minor chalcopyrite, galena, gold, carbonate, and tourmaline.

Pichette Occurrence

The Pichette Occurrence is located in the north-central part of Vincent Township, 20 km east-northeast of Beardmore. Access is by road from the CNR tracks near the northwestern end of Nezah Lake. Stripping and trenching have revealed 2 mineralized zones.

Mineralization consists of pyrite and gold in a sheared and carbonatized mafic metavolcanic host rock. A mineralized zone can be traced for 54 m and may be up to 90 m wide. Gold can be panned at several locations (G. Pichette, Prospector, Nipigon, personal communication, 1982). Grab samples assay up to 0.22 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

The second zone was discovered to the southeast. Trenching exposed a quartz vein in a sheared and carbonatized mafic metavolcanic. The vein is 1.0 m wide and can be traced for 6 m.

Theriault-Culhane Occurrences

Ozias Theriault of Geraldton holds claims covering 4 occurrences in Croll Township, south of Highway 11. The ground was previously held by H. Holm and J. Wodian who trenched all 4 showings and diamond drilled Occurrence Number 3 (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Occurrence Number 1 is an east-striking lenticular quartz vein hosted by sheared, mafic metavolcanics. The vein, exposed in a trench, can be traced for 6.0 m in an easterly direction. The vein pinches and swells from 0 cm to 20 cm. Pyrite and chalcopyrite mineralization is exposed in the vein, and in the metavolcanic host rock.

Occurrence Number 2 is a possible eastern extension of Occurrence Number 1. Pyrite and chalcopyrite mineralization exists along shear-fracture planes in mafic metavolcanics.

Occurrence Number 3 is a smokey quartz-tourmaline vein, hosted by fine-grained metasediments consisting of cherty, carbonatized, siltstone.

Occurrence Number 4 is a north-striking sulphide-enriched fracture zone containing minor quartz stringers, and is hosted in mafic metavolcanics. Pyrite and chalcopyrite were noted in 1.8 m of the zone's width, although the sulphide enrichment is greatest along the trench's west wall.

Vega Occurrence

The Vega Occurrence is located in the Townships of Vincent and McComber, 15 km east-northeast of Beardmore. Previous work (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) has outlined 2 parallel ironstones hosted in mafic volcanic rocks that are approximately 37.5 m apart and that trend 75°. The ironstones can be traced in a series of trenches from the Craskie Gold Property to the east. The ironstones are chert-magnetite-carbonate ironstones locally sheared, with quartz

veins developed. Mineralization consists of arsenopyrite and gold associated with the quartz veins. Grab samples assayed from trace to 1.16 ounces gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

(2) Stock Related and/or Metavolcanic-Hosted Type

The second type of gold deposit is typically high grade, low tonnage. The largest deposit is the Quebec Sturgeon River Gold Mine which produced 73 438 ounces of gold at a grade of 0.51 ounce gold per ton (Ferguson *et al.* 1971). The deposits are auriferous quartz (carbonate) veins in mafic to felsic metavolcanics, often marginal to granitic intrusive stocks.

Property Visits

Consolidated Louanna Gold Mines Limited

The Consolidated Louanna Gold Mine, 41.0 km northwest of Nakina and operated by Graham Mining Limited, produced gold concentrate during the period February to mid-October from 6534 tons of ore. Graham Mining Limited had marketed 680 ounces of gold by the end of October. This amount includes neither includes gold trapped in the mill circuit nor the arsenic-rich gold concentrate shipped to the smelter of Asarco Exploration Company of Canada, Tacoma, Washington (Ted Graham, President, Graham Mining Limited, Toronto, personal communication, 1982). The deposit is estimated to contain 113 128 tons assaying 0.352 ounce gold per ton (Carter 1972, Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The mineralization occurs in quartz veins hosted in a quartz-feldspar porphyry. The quartz-feldspar porphyry is in turn emplaced in mafic tuffs which have been sheared. The veins show laminated to brecciated textures. The quartz is of several generations. The mineralization consists of arsenopyrite, pyrite, pyrrhotite, sphalerite, galena, and gold. Sphalerite is the mineral indicator for gold. Carbonate alteration occurs adjacent to the veins. Locally, the veins may pinch out leaving only the zone of carbonate alteration. A younger generation of barren quartz-carbonate veins cut all rock types.

A new mineralized zone was discovered in 1982, parallel to the original deposit. The new zone is separated by 6 m of barren wall rock from the original deposit. Both zones are open along strike and to depth.

Crooked Green Creek Mine (Northern Concentrators Limited)

The Crooked Green Creek Mine is located in Pifher Township, 24.0 km northeast of Beardmore. Thyssen Mining Construction of Canada Limited mined 800 tons of ore which was shipped to the mill of Northern Concentrators Limited in Thunder Bay. The jig concentrate was sold to Johnson Matthey Limited, Toronto (B. Doucet, Manager, Northern Concentrators' Mill, Thunder Bay, personal communication, 1982).

The workings consist of an open cut 70 m in length with an abandoned declined shaft near the centre. The mineralization is hosted in a sigmoidal quartz vein cutting a feldspar porphyry, dacite, and minor andesite. The vein dips 45° to 70° south, and is 0.3 m to 0.6 m wide near the shaft; to the west the vein flattens to 10° and thins to 5 cm; to the east the vein narrows to < 5 cm. The mineralization consists of chalcopyrite, pyrrhotite, and gold in blue-black quartz.

Greenoaks Prospect

The Greenoaks Prospect, in the Townships of Elmhirst and Pifher located 27 km northeast of Beardmore, is held by B. Miron. Thyssen Mining Construction of Canada Limited mined 1400 tons of ore (B. Miron, Prospector, Thunder Bay, personal communication, 1982). This material was milled at Pan-Empire Joint Venture Mill, Beardmore and Northern Concentrators' Mill, Thunder Bay.

The property is underlain by andesite, dacite, and feldspar porphyry. A series of quartz veins and fracture fillings strike 110°. Mineralized veins and host rock contain chalcopyrite, pyrrhotite, and gold.

Mitto Prospects (Kengate Resources Limited)

A. Mitto holds a gold-silver property in the northwestern corner of Elmhirst Township, 22 km northeast of Beardmore. Four subparallel veins striking 30° to 35° are hosted in andesite and dacite. The veins contain breccia zones of rounded and angular quartz clasts cemented in a sulphide matrix of fine-grained pyrite, sphalerite, galena, and chalcopyrite. Coarser grained sulphide minerals are also present. The veins are 0.2 m to 0.5 m wide and dip vertically. Gold values varying from 0.1 to 0.52 ounce gold per ton were obtained on selected grab samples (Geoscience Laboratories, Ontario Geological Survey, Toronto). To the east, a lenticular quartz-carbonate vein trending 32° containing minor pyrite, is exposed over a strike length of 150 m. The northeastern end of the vein varies between 7.6 cm and 30.5 cm wide. The southwestern end of the vein varies in width from 0.6 m and 0.9 m. Sheared wall rock is altered to sericite and chlorite. Assays of 6 grab samples gave traces of silver and gold values varying from between trace amounts to 0.02 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

(3) Placer Type

Shield-Evans-Jackson Placer Occurrence

Jay Shields, George Evans, and Paul Jackson of Geraldton have a placer gold occurrence immediately southwest of O'Sullivan Lake. Gold can be detected in some cases by assay, or by panning in an outwash esker environment in gravel pits along Highway 643 and along the access road into the Consolidated Louanna Gold Mine. Sections in the pits consist of

interbedded coarse pebble to fine sandy, silt beds. The beds are 5 to 10 cm in thickness. Grab samples have yielded assays that range from trace amounts to 0.28 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

Base Metals

Con Creek Prospects (Americ Mines Limited-Cane Consolidated Explorations Limited Joint Venture)

The Can-Americ Joint Venture holds a large block of claims west of Onaman Lake covering several base metal-precious metal showings optioned from D. Thorsteinson and N. Cox, both of whom are prospectors from Beardmore. The regional geology (Amukun 1980) consists of pillowed, massive basalts bounded on the east by the West Onaman Lake Granitic Batholith. Younging directions are to the west and southwest.

Linecutting, magnetometer surveys, and VLF surveys have been completed on the entire block. The 4 main volcanogenic sulphide showings drilled this year (1982: 19 holes) were: the South Lead-Zinc-Silver, the South Copper, the South Zinc, and the North Loop Zinc showings. The showings were found by tracing float and/or tracing a carbonate horizon found on the Lynx Canada Explorations Limited deposits to the north.

The South Lead-Zinc-Silver showing is hosted by a carbonate horizon contained within silicified and carbonatized basalts. The showing, which is up to 2.4 m wide at surface, contains galena, sphalerite, chalcopyrite, and pyrite in a matrix surrounding silicified and carbonatized basalt fragments. This unit is overlain by basalt, mafic tuff, and minor banded chert. The best drill intersection yields 6.50 ounces silver per ton over 0.6 m (M. Watson, President, Lynx-Canada Explorations Limited, Toronto, personal communication, 1982).

The South Copper showing consists of a narrow zone of disseminated to massive chalcopyrite and pyrrhotite hosted by pillow basalts. The showing has been traced for a length of 39.0 m. The sulphides occur in pillow rims, and in a massive lens with rounded quartz eyes. The 2 zinc showings are narrow zones of massive sphalerite with galena and pyrite. The South Zinc showing is conformable with a sulphide/oxide iron formation.

Kirby Lake Zinc Occurrence

The property held by Joe Oster is located 16 km northwest of Geraldton. A shear zone occurs in mafic metavolcanics striking east and dipping 58° south. The zone is up to 1.5 m wide with parts of the zone (up to 0.45 m wide) mineralized with sphalerite and galena. Unmineralized areas are now quartz-biotite-schists. The entire zone has been silicified, carbonatized, and sericitized. A sulphide iron formation (0.3 m wide) is situated conformably at the north contact. The 1.5 m wide shear zone could not be traced along strike.

Chip samples across 2 0.3 m sections gave assays of 4.87 and 3.16 ounces silver per ton. Gold values were low (Geoscience Laboratories, Ontario Geological Survey, Toronto).

Recommendations for Exploration

The availability of the Pancontinental Mining (Canada) Limited custom Mill at Beardmore, Ontario, and good road access throughout the area, suggests that small tonnage gold showings, prospects, deposits, and all dumps should be reassessed.

(1) The margins of felsic intrusive stocks and batholiths should be prospected for low tonnage, high grade deposits (e.g. Quebec Sturgeon River Gold Mine (Deposit Type 2)).

(2) The eastern extension of the Wabigoon Subprovince east of Long Lac, and its western extension, the Black Sturgeon Lake (see section on "Uranium"), Max Creek, and Heaven Lake areas, should be explored for gold mineralization.

(3) The Melchett Lake and the O'Sullivan Lake-Marshall Lake metavolcanic-metasedimentary belts, and possible extensions, should be investigated for gold and base-metal deposits. Drilling, geophysics, and mapping data (Bond and Foster 1981a, 1981b; Moorhouse 1956) suggest high mineral potential in many areas.

(4) Gold mineralization in magnetite ironstone is associated with replacement type sulphide minerals such as pyrite, arsenopyrite (e.g. MacLeod-Cockshutt Gold Mine). VLF and magnetometer surveys could be used to detect such targets (Deposit Type 1).

Atikokan Economic Geologist Program

Introduction

The Atikokan Economic Geologist Program continued into its fourth year during 1982, and was staffed by Resource Geologists B.R. Schnieders and R.J. Dutka. The purpose of the program is 3-fold: 1) to provide assistance and information to prospectors and mining companies involved in the Atikokan area; 2) document old and new mineral occurrences and; 3) to create incentives for mineral exploration.

The program encompasses an area from Shabaqua west to Rainy Lake, and is funded by the Ontario Ministry of Northern Affairs.

During 1982, approximately 30 (Figure 5) properties were visited in the program area, several of which are described below. A complete report of all property visits conducted by the Atikokan Economic Geologist Program through 1979 to 1983 is in progress and should be available by mid-1983. All assays reported herein were performed by the Geoscience Laboratories, Ontario Geological Survey, Toronto, unless otherwise noted.

Adjoins Figure 3

Adjoins Figure 1

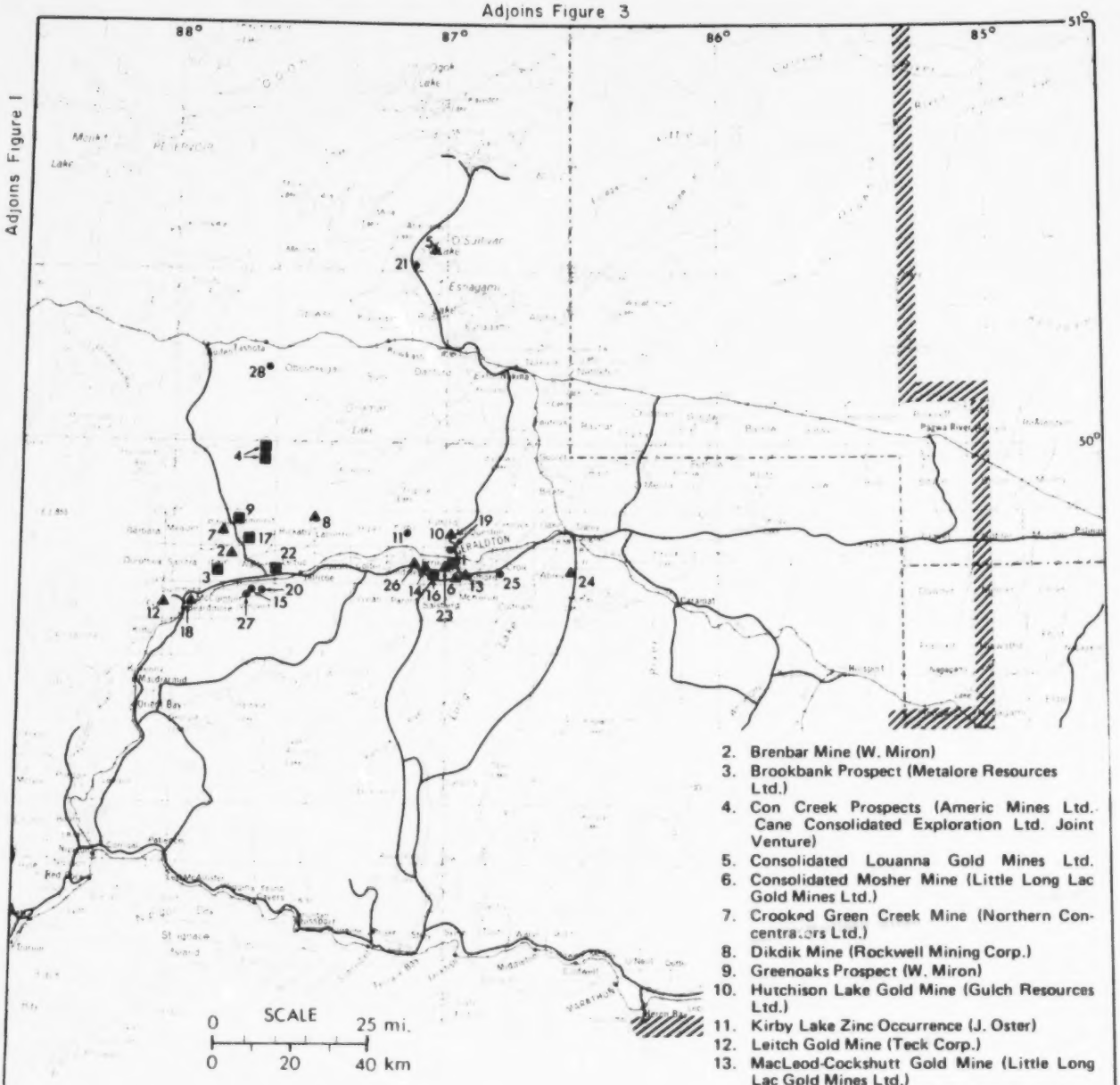


Figure 5

▲ MINE (including past producers) - with a minimum production of not less than 100 ounces of gold

■ PROSPECT - with significant development work usually consisting of one or more of the following:

(a) Production of less than 100 ounces of gold;
(b) over 100 feet of underground lateral development work;
(c) over 2000 feet of diamond drilling

• OCCURRENCE - little development work carried out

Property Visits: (1982) Beardmore-Geraldton Economic Geologist Property

1. Algoma Steel Corp. Ltd. (Barton Bay) Iron Prospect
2. Brenbar Mine (W. Miron)
3. Brookbank Prospect (Metalore Resources Ltd.)
4. Con Creek Prospects (Americ Mines Ltd. - Cane Consolidated Exploration Ltd. Joint Venture)
5. Consolidated Louanna Gold Mines Ltd.
6. Consolidated Mosher Mine (Little Long Lac Gold Mines Ltd.)
7. Crooked Green Creek Mine (Northern Concentrators Ltd.)
8. Dikdik Mine (Rockwell Mining Corp.)
9. Greenoaks Prospect (W. Miron)
10. Hutchison Lake Gold Mine (Gulch Resources Ltd.)
11. Kirby Lake Zinc Occurrence (J. Oster)
12. Leitch Gold Mine (Teck Corp.)
13. MacLeod-Cockshutt Gold Mine (Little Long Lac Gold Mines Ltd.)
14. Magnet Consolidated Mine (Roxmark Mines Ltd.)
15. Maki Occurrence
16. McLellan Prospect (Roxmark Mines Ltd. - Lynx Canada Explorations Ltd. - Canadian Reynolds Metals Co. Ltd. Joint Venture)
17. Mitto Prospects (Kengate Resources Ltd.)
18. Northern Empire Mine (Pan Empire Joint Venture)
19. Oster's Errington Claims
20. Pichette Occurrence (Amax Minerals Exploration)
21. Shields-Evans-Jackson Placer Occurrence
22. Solomon's Pillars Prospect (Lynx Canada Explorations Ltd.)
23. Talmora Gold Mine (Tombill Gold Mines Ltd.)
24. Theresa Gold Mine (Laird-Phelan)
25. Theriault-Culhane Occurrences
26. Tombill Gold Mines Ltd.
27. Vega Occurrence (J. Ternowesky)
28. Yzerdraat Claims

TABLE 5 **Gold Production in the Atikokan Program Area**

Mine	Years	Ounces Gold	Ounces Silver	Tons of Ore Milled	Average Grade Gold	Average Grade Silver
Elizabeth	1913	20	-	50	0.40	-
J. J. Walsh	1934	21	13	350	0.06	0.04
Atiko (Sapawe)	1964-66	4,547	1,315	33,013	0.14	0.04
Sunbeam	1904	272	-	650	0.42	-
Sawbill	1897-99 1940-41	1,009	72	5,368	0.19	0.01
Harold Lake	1895-96	647	-	1,131	0.57	-
White Lily	1933	2	4	65	0.03	0.06
Hammond Reef	1897	222	-	977	0.22	-
Independance	1896-1899	121	-	125	0.97	-
Foley	1897-98 1933-35	855	149	5,568	0.15	0.27
Golden Crescent	1897	93	-	192	0.48	-
Golden Star	1898-1901 1934-1938 1941	10,758	34	19,345	0.56	-
Isabella Prospect	1919-1920	15	2	2	7.50	1.00
Lucky Coon	1899 1935-36	10	1	10	1.00	0.10
Olive	1897-1900 1937 1941-1942	3,572	343	7,255	0.49	0.05
Saundary	1934	13	-	13	1.00	-
Kerry Mine (Ardeen)	1932-36 1942	29,948	172,376	143,724	0.21	1.20
Golden Winner	1900	4	-	15	0.29	-
TOTALS		52,129	174,309	217,853	0.24	0.80

(Compiled from OGS Statistical Files).

Gold Mineralization

Gold deposits in the Atikokan Program area are concentrated in 3 main areas: the Shabaqua-Shebandowan Lakes area, the Atikokan area, and the Mine Centre area. Production is summarized in Table 5.

Shabaqua-Shebandowan Lakes Area

Two distinct environments of gold mineralization were recognized in the Shabaqua-Shebandowan Lakes area;

Type 1) Shebandowan Stock-Contact Zone Type: Gold mineralization occurs in quartz ± carbonate veins in shear zones, related to the Shebandowan Stock. Examples include the Band-Ore Prospect, Frank West Prospect, Hayne's Shebandowan Occurrence, Labanor Occurrence, Calvert Occurrence, and Ourgold Occurrence.

Type 2) Chert-Stratabound Type: Gold mineralization occurs in a chert-chert breccia unit, with possible syngenetic implications and/or epigenetic concentration during dynamic metamorphism and/or deformation. Examples include the Dawson Road Lots Occurrence, Birch Bay, and Mattawin Occurrences.

Type 1: Band-Ore Prospect

The Band-Ore Prospect is located in Conacher Township, approximately 80 km west of Thunder Bay. The property is divided by Highway 11 and straddles the Swamp River on the northern shore of Lower Shebandowan Lake.

The general geology of the Band-Ore Prospect consists of predominately intermediate to mafic metavolcanics that have been intruded by mafic sills and porphyritic felsic rocks.

The metavolcanics consist of interbedded flows and pyroclastic rocks, with the flows displaying a transition from a massive basal part through an intermediate pillowed sequence, to an upper section of hyaloclastite (aquagene breccia) and pillow breccia. Slump breccias are associated with the pillowed flows.

Overlying the flow units are up to 1000 m of pyroclastic rocks (Morin 1973) composed of fine-grained tuff, lapilli-tuff, and tuff breccia. Felsic metavolcanic units occur intercalated with the mafic flows and pyroclastic rocks.

Feldspar-quartz, quartz and feldspar porphyry dikes, sills, and stocks intrude the metavolcanics, and appear to have some stratigraphic and/or structural control. The porphyry units are related to either the Shebandowan Lake Stock or to the felsic metavolcanic as near surface (sub-layer) intrusions.

Gabbro sills and/or possible coarse-grained mafic metavolcanic flows occur intruding and intercalated with the metavolcanic sequence.

The Shebandowan Lake Stock is composed of quartz-diorite in the Band-Ore Prospect area. Shear zones are well developed in all rock types; however, shearing, carbonatization, and silicification is most intense near the contacts of the stock.

The metavolcanics display a well-developed southeast-trending schistosity, subparallel to both the Crayfish Creek and Postans Faults.

Gold mineralization on the Band-Ore Gold Mines Limited Property is associated with shear zones which occur in all rock types. The shear zones display extreme development in the porphyry intrusions. Gold mineralization in the Main Zone which includes the West Zone, Central Zone, and East Zones, is associated with a southeasterly trending feldspar porphyry that is 122 m wide.

Up to 1980, approximately 70 diamond-drill holes indicated that the main gold structure is 1200 m in length, with 2 known mineralized zones each approximately 213 m in length (Clayton 1980, Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Gold mineralization has been intersected by diamond drilling at vertical depths that approach 152 m.

Local schistosity and shearing strike 270° and dip 80°N to vertical in the area of the main trenches. The mineralized shear zones in the feldspar porphyry display silicification and carbonatization, and average 1 m in width.

As shearing becomes more intense, the feldspar porphyry gradationally alters to a sheared carbonatized rock containing abundant sulphide minerals. The final product is a silicified, fine-grained sericite-carbonate schist, containing erratic quartz-carbonate veins. The quartz-carbonate veins vary up to 15 cm in width and contain fine- to coarse-grained pyrite and chalcopyrite. Horwood (Unpublished Report, dated 1945, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) postulated that the gold was associated with the chalcopyrite. Accessory minerals include tourmaline and epidote.

Several tonnage and grade calculations for the main zone have been proposed, 2 of the most recent estimates are; a) 778 000 tons grading 0.20 ounce gold per ton with an additional 280 000 tons grading 0.08 ounce gold per ton, in 10 separate zones (Clayton 1980, Unpublished Report, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay); b) unweighted speculative tonnage of 687 500 grading 0.26 ounce gold per ton or a weighted speculative tonnage of 471 500 grading 0.20 ounce gold per ton (Neilson and Bray 1981).

Gold mineralization in the Number 4 zone (Mattagami Lake Exploration Limited, Induced Polarization, anomaly) is associated with quartz-carbonate veins hosted by quartz-sericite schists. Thin section examination of samples from Hole BO-81-13 has indicated a marked increase in foliation (shearing), carbonatization, silicification, and pyritization has affected the rocks hosting the gold mineralization.

The quartz-carbonate vein that occurs in Hole BO-81-13 has several ages of quartz and carbonate mineralization, indicating a multi-stage intrusive or deformational process. Mineralization consists of fine- to coarse-grained pyrite and accessory minerals such as tourmaline, epidote, and actinolite. Thin section examination indicates that mainly the felsic metavolcanic unit, initially hosted the mineralized quartz-carbonate veins.

The Number 8 zone was optioned by Mattagami Lake Exploration from Greenwich Lake Exploration Limited, in which Band-Ore Gold Mines Limited has a 22.5% interest. This zone is located approximately 2 km west of the Band-Ore Main Zone. Gold mineralization is associated with shear zones within intermediate metavolcanics that are in contact with a feldspar-quartz porphyry.

This section examination of samples from Hole GW-81-1 indicates a gradational increase in foliation (shearing), carbonatization, sericitization, silicification, and pyritization as the mineralized zone is approached. The mineralized zone consists of a carbonate-chlorite-sericite schist that contains up to 15% pyrite in localized areas. A notable increase in grain size in both the pyrite and mineralized schist was observed, possibly indicating recrystallization. Two generations of pyrite mineralization are present, a fine-grained, disseminated and later coarse-grained pyrite. Gold occurs in pressure shadows around pyrite crystals and in fractures with quartz-carbonate-chlorite veinlets. This suggest that the gold mineralization event is later than the pyrite mineralization event.

Diamond drilling on the Number 4 zone indicate grades up to 0.296 (uncut) or 0.185 (cut) ounce gold per ton over 8.1 m in Hole BO-81-10; 0.9 (uncut) or 0.44 (cut) ounce gold per ton over 2.3 m in Hole BO-81-13 (The Northern Miner, December 24, 1981).

A recent study of heap leaching possibilities of several Ontario gold ores indicates that "ore" from the Band-Ore Main Zone is "an extremely good candidate for heap leaching" (Witte 1981). Diamond drilling on the Number 8 zone intersected a 4 m zone grading 0.798 ounce gold per ton and 4.01 ounces silver per ton in Hole GW-81-1.

Type 2: Dawson Road Lots Occurrence

The Dawson Road Lots are located approximately 58 km west of Thunder Bay, along Highway 11-17. The Dawson Road Lots Occurrence contains the Birch Bay and Mattawin Occurrences.

The general geology consists of a predominately east-trending belt of intermediate to felsic metavolcanics, composed of massive to pillowed andesite flows, porphyritic dacite flows, and massive to tuffaceous rhyolite units. Chemical sediments, consisting of chert, chert breccia, and oxide ironstone occur intercalated with the rhyolite units.

A sequence of conglomerate, arkose, wacke, and slate occurs to the north of the metavolcanics. Diorite, gabbro, and diabase are also present in the area.

All rock units appear conformable, striking approximately 80° and dipping steeply to the south. Schistosity and foliation generally parallel the bedding, with near vertical dips. The metavolcanics face north while the metasediments face south. This suggests a possible east-trending synclinal axis.

The gold mineralization is hosted by chert and chert breccia units located in 2 zones and separated by up to 10 m of barren rhyolite breccia. The chert units appear lenticular and vary in width up to 10 m, but the units average approximately 3 m in width.

Several periods of deformation appear to have affected the area. The chert units display evidence of brecciation, horizontal and vertical fracturing, quartz veining, and minor displacement. Silicification, carbonatization, and pyritization are evident in the mineralized zones and country rocks.

Mineralization includes several generations of pyrite, minor arsenopyrite, and gold. Possible syngenetic pyrite and epigenetic pyrite are present, with the latter more evident and associated with tightly spaced horizontal fractures. A strong VLF-EM anomaly, which appears related to a graphitic chert unit, is present near both gold occurrences (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The author selected 14 grab samples and chip samples from the Main Zone (Mattawin Occurrence Trenches); the best results give 0.39 ounce gold per ton from a selected grab sample, and 0.36 ounce gold per ton across a 2 m wide chip sample.

Atikokan Area

Wilkinson (1980, 1982) defined 3 classifications of gold mineralization in which gold is concentrated in quartz and quartz-carbonate veins in the Atikokan area; 1) Metavolcanic-Hosted, Stratabound Type; 2) Marmion Lake Batholith Type and; 3) Contact Zone Type.

Type 1) Metavolcanic-Hosted, Stratabound Type; Gold mineralization is concentrated in quartz and quartz-carbonate veins hosted by shear zones in chemical sedimentary rocks and/or predominately altered, metavolcanic fragmented units. These rocks may represent syngenetic source rocks for gold mineralization. Such rocks can be subjected to deformation, hydrothermal activity, and epigenetic (metamorphogenic) enrichment associated with dynamic metamorphism events and/or felsic intrusive events.

The author of this section of this report further divides this mineralization type into the following categories:

a) Chemical Sediment Type; exemplified by the Mining North Occurrence (Sawdo-Claims or Red Paint Lake Occurrence).

b) Fragmental Type; with examples including the Mayflower Prospect, Olcott Prospect, Agnico Eagle Occurrence, and Sandy Lake Occurrence.

Type 2) Marmion Lake Batholith Type. This type occurs within the gneissic core of the batholith and is associated with northeast-trending lineaments which represent faults or shear zones. Mineralized veins are related to several periods of deformation and shearing, suggesting that metamorphogenic veins were produced during dynamic metamorphism. Examples include the Hammond Reef, Sawbill, Minto, Plator Gralouise, Hawk Bay, Roy, Pettigrew, Sunbeam, and Reserve Island Properties.

Type 3) Contact Zone Type. This type occurs in the contact zone rocks between gneissic batholiths and metavolcanic belts. Hydrothermal solutions produced during several deformational periods acted to leach and concentrate gold mineralization. Localized, discontinuous shear zones host the epigenetic (metamorphogenic) veins. Examples include the Harold Lake, Elizabeth, Blackfly, Hill Lake, White Lily, and Sapawe Properties.

Type 1: Mining North Property (Sawdo Claims)

The Mining North Property, formerly known as the Sawdo claims, is located in the Lumby Lake area, approximately 35 km northeast of Atikokan. The claim block covers several base-metal and gold occurrences. The gold occurrences include the Anderson Occurrence, Blowout Occurrence, and Redpaint Lake or Alcock Occurrence. Further prospecting discovered what is known as the Mining North Occurrence or Sawdo Claims Occurrence.

The country rocks are intermediate to mafic, metavolcanic flows, containing intercalated pyroclastic rocks, metasediments, and chemical sedimentary rocks. Coarse-grained mafic flows and/or gabbro sills intrude the metavolcanic pile. Intrusive granitic rocks are located approximately 1 to 3 km to the west.

Pyroclastic rocks include tuff, lapilli-tuff, tuff breccia, and breccia units which commonly display extreme carbonatization, sericitization, chloritization, and silicification that was sufficient to produce chlorite-sericite-carbonate schists. Intercalated metasediments include arkosic and pelitic rocks, but chemical sedimentary rocks consist of carbonate (ankerite) and minor chert lenses. A rather peculiar quartzite unit (possible sheared quartz-feldspar porphyry) containing nodular pyrite, is associated with the metasedimentary-chemical sedimentary sequence.

The carbonate-rich rocks include altered tuffs, carbonate breccias and lenses, and chlorite-sericite-carbonate schists. These laterally continuous units are traceable for lengths of up to 2 km. Gold mineralization is present in anomalous but sub economic levels in the ankerite lenses. Selected grab samples collected by the author (Schneiders) assay up to 0.05 ounce gold per ton.

Gold mineralization is concentrated in quartz and quartz-carbonate veins which crosscut all rock types. These veins are commonly hosted by carbonate units or pyroclastic rocks. The vein systems generally strike 90° and are subparallel to the foliation in the metavolcanic sequence. In the vicinity of the northeast-trending Redpaint Lake Shear Zone, the veins are subparallel to it.

Mineralization includes pyrite, arsenopyrite, chalcopyrite, and gold associated with tourmaline, chlo-

rite, and accessory minerals such as green chromium muscovite. Assays of selected grab and chip samples collected by the author could be generally discouraging. One grab sample of quartz-carbonate float material collected by the author assays 2.33 ounces gold per ton and 0.59 ounce silver per ton.

The property has recently undergone detailed mapping, geophysical, geochemical, and sampling programs by Mining North Explorations Limited of Atikokan.

Type 2: Reserve Island Occurrence

The Reserve Island Occurrence is located on patented mining claim WN-5, approximately 40 km east-northeast of Atikokan on Lower Seine Bay of Marmion Lake.

The host rocks consist of gneissic trondhjemite, tonalite, and granodiorite of the Marmion Lake Batholith.

A 21.3 m shaft and 15.2 m of lateral development are present on the property. Recent exploration includes stripping and sampling (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Gold mineralization occurs in a quartz vein striking 75° and dipping 55° north-northwest. The vein varies in width from 0.5 m to 3 m and is exposed for approximately 100 m. The vein is hosted by a massive hornblende trondhjemite which in places has been progressively altered to form chlorite schists. Host rocks display evidence of carbonatization, silicification, and pyritization. A 15 cm wide zone of nearly massive pyrite, chalcopyrite, sphalerite, galena, and visible gold is contained within the quartz vein, possibly indicating 2 or several generations of quartz veining. Accessory minerals include sericite, ankerite, green chromium muscovite, chlorite, and tourmaline.

Seven chip samples and numerous selected grab samples were collected by the author (Schneiders). Chip samples assay up to 0.03 ounce gold per ton over a width of 2.5 m. Selected grab samples from the dump material assay up to 19.74 ounces gold per ton and 6.18 ounces silver per ton.

Type 3: Hill Lake Prospect

The Hill Lake Prospect is located in the central section of Hutchinson Township, approximately 26 km east of Atikokan, and is situated in the Contact Zone between the plutonic rocks of the Marmion Lake Batholith and the metavolcanics to the south. Country rocks consist of predominately trondhjemite, tonalite, and granodiorite with intercalated metavolcanic and gabbroic rocks. The felsic metavolcanics exposed include fine-grained quartz porphyry rhyolite and a heterolithic volcanic tuff-breccia which contain rhyolite and mafic to intermediate fragments up to several cm in size. Gabbroic intrusive rocks display a porphyritic texture and are carbonatized, foliated, and folded near the vein systems. The gold mineralization is restricted to east-striking quartz-carbonate veins that vary from several cm to over 3 m in width, and which have been exposed by stripping for approximately 200 m. Similar vein systems such as the Monty's Jewelry Store Vein have been exposed approximately 1 km to the east, and may represent parallel vein systems. The vein consists of milky white quartz, pyrite, arsenopyrite, chalcopyrite, ankerite, and tourmaline.

Chip and selected grab samples were collected by the author (Schneiders) with chip samples assaying up to 0.07 ounce gold per ton across a 4.5 m width. Selected grab samples indicated values up to 1.41 ounces gold per ton and 0.43 ounce silver per ton from the Hill Lake Prospect, and up to 2.14 ounces gold per ton and 0.44 ounce silver per ton from the Monty's Jewelry Store Occurrence.

Mine Centre Area

Gold mineralization in the Mine Centre area occurs in quartz and quartz-carbonate veins contained in shear and dilation zones that crosscut all rock types. Poulsen (1981) recognized 81 gold-bearing quartz veins in the Mine Centre area. Seventy-five percent occur preferentially in the coarse-grained plutonic rocks of the Bad Vermilion Intrusion or in intermediate to felsic metavolcanics, both amenable to multiphase deformation and hydrothermal activity.

Poulsen (1980, 1981) classified gold-bearing vein systems restricted to rocks of greenschist facies metamorphism as: 1) first order fissure veins related to discrete shear zones; 2) second order extensional veins which are normal to the foliation; and 3) third order foliation parallel to the veins.

Structures and quartz c-axis petrofabrics within the fault zone, the orientation of the conjugate regional fault sets, and the orientation of the mineralized vein systems indicate that the Quetico Fault is a major dextral wrench fault (right lateral strike-slip fault) with major displacement in the Atikokan-Mine Centre area (M. Kennedy, Resource Geologist, Ontario Ministry of Natural Resources, Thunder Bay, personal communication, 1982).

The following subdivision of gold mineralization types is suggested and expanded upon by the author (Schneiders):

Type 1; Bad Vermilion Intrusive Type. Gold mineralization is concentrated in quartz and quartz-carbonate veins, contained in ductile shear zones in predominately tonalite-trondhjemite rocks of the Bad Vermilion Intrusion and its contact zone. Shear zones are commonly parallel to northwest or northeast-trending conjugate fault sets related to the Quetico Fault. Examples include the Foley Mine, McKenzie-Gray, Russell C. Cone Mine, Ferguson, Manhattan, Decca, Stagee, Lucky Coon, Golden Star Mine, Stellar, and South Vermilion Properties.

Type 2; Metavolcanic-Hosted Type. Gold mineralization is concentrated in quartz and quartz-carbonate veins contained in ductile shear zones in predomi-

nately intermediate to felsic metavolcanics. Shear zones are commonly parallel to major east-trending or northeast-trending regional faults such as the Quetico and Seine River Faults. Examples include the Olive Mine, Saundary, McMillan, Alice A, Dinosaur, and Smylie Properties.

Type 1: Foley Mine

The Foley Mine consists of patented mining claims AL74, AL75, and AL76, and is located approximately 9 km south of Mine Centre. Although the reported production figures are questionable, approximately 5000 ounces of gold appear to have been produced between 1894 to 1898 and 1933 to 1935 (R. Cone Jr., Owner, Mine Centre, personal communication, 1982).

Numerous gold-bearing quartz veins are hosted by ductile shear zones in massive to foliated tonalite of the Bad Vermilion Intrusion. The principal veins occupy the centre of the shear zones, and the host rocks display carbonatization, sericitization, saussuritization, and chloritization. Foliation present in the sheared tonalite is commonly oblique at approximately 45°, and sub-horizontal slickenslides are observed on the vein-wall rock surfaces. The angular relationship between the principal veins and the foliation present in the sheared tonalite suggests evidence of predominately left-lateral (sinistral) shear zones throughout the Foley Mine Property.

The North shaft sunk on the "Bonanza Vein", has a vertical depth of 259 m with 3.5 km of lateral development work (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The vein strikes 170° and dips 85° and varies in width from 0.3 m to 1.5 m. A 30 cm chip sample collected by the author assays 0.04 ounce gold per ton.

The "Jumbo Vein" is located approximately 30 m south-southwest of the "Bonanza Vein", striking 150° with a vertical dip. Recent stripping has exposed the "Jumbo Vein" along strike for over 122 m. The vein varies in width from 0.5 m to 1.8 m. Several branching or splay veins were observed, and it is probable that the "Bonanza Vein" is also a splay vein. These splay veins may represent sealed fissures or conjugate faults produced during ductile shearing. Mineralization includes pyrite, chalcopyrite, sphalerite, galena, and gold. The veins display a banded appearance produced through a crack-seal process during a multiphase deformational period. Chip samples collected by the author give values of as much as 0.12 ounce gold per ton across a 1.2 m width.

The "West Vein" is located approximately 100 m west of the north shaft, and has a 27 m shaft sunk on a vein approximately 0.5 m wide. Samples collected by the author assay trace amounts of gold.

The "Sulphide Vein" was observed in both the northeastern and southeastern corners of mining claim AL74, giving it a possible strike length of approximately 450 m; however, it is not known if the northern and southern exposures are truly the same vein structure. The vein strikes 150° to 160° with a near vertical dip, and varies in width from 0.75 m to 1.25 m. Sulphide mineralization is abundant, and includes sphalerite, galena, pyrite, chalcopyrite, and minor arensopyrite. One 2 m by 2 m shaft was sunk to a depth of approximately 23 m on the northern exposure; however, no production was reported. Selected grab samples collected by the author assay 0.51 ounce gold per ton, 3.54 ounces silver per ton, 0.25% lead, 19.5% zinc, and up to 1.11% copper (Geoscience Laboratories, Ontario Geological Survey, Toronto).

The "Galena Vein" located near the southern boundary of AL75, strikes 165° and dips 82° east. The 25 cm wide vein contains pyrite, sphalerite, galena, and chalcopyrite, and is exposed in a 12 m long trench and a 15 m deep shaft. One selected grab sample collected by the author assays 0.20 ounce gold per ton.

The South shaft sunk on the "Daisy Vein" is located on AL75, and is reported to be 61 m deep. The "Daisy Vein" averages 1 m in width and stikes 160° and dips 85° east, and has a surface exposure of approximately 90 m. Mineralization consists of galena, sphalerite, pyrite, and gold.

The "Lucky Joe Vein" is located approximately 100 m east of the South shaft. The narrow (18 cm to 20 cm) vein strikes 170° and dips 75° east, and is exposed along a 61 m strike length. A 27 m shaft was sunk on the "Lucky Joe Vein", and it connects with the South shaft on the 23 m level. Mineralization includes pyrite, galena, and visible gold. Selected grab samples collected by the author assay up to 2.26 ounces gold per ton. Numerous other veins are present on the property including the "E and A Veins".

Recent exploration work includes stripping, trenching, geological mapping, geochemical surveys, and sampling by Sherritt-Gordon Mines Limited.

Type 2: Olive Mine

The Preston or Olive Mine is located about 7 km west of Mine Centre. Initially discovered in the late 1800s, the recorded production between 1897 and 1942 is 3572 ounces of gold and 353 ounces of silver. The average production grade is 0.49 ounce gold per ton (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Development work consisted of 4 shafts, with the main or number 1 shaft being a 2-compartment inclined (70°) shaft sunk to a depth of 76 m, with levels at 18, 41, and 74 m (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Quartz veins up to 64 cm wide are hosted by layered, foliated, and silicified felsic volcanic rocks that contain small horizons of chert. This unit is intercalated with intermediate to mafic porphyritic flows. The tuffaceous felsic metavolcanics are locally mylonitic. The main vein strikes 85° and dips 70° to 76° south.

The quartz vein varies in texture from coarse-grained saccharoidal quartz to fine-grained smokey blue quartz. Mineralization is exposed for 500 m, and includes pyrite, pyrrhotite, chalcopyrite, graphite, and gold. Minor parallel quartz veinlets were also observed near the shaft and dump areas.

Selected grab samples assay over 11 ounces gold per ton and 2.17 ounces silver per ton. Chip samples give results of 0.58, 0.26, 0.89 and 0.22 ounce gold per ton across 2 m and 2.5 m widths. Samples of the rhyolite host assay trace and 0.01 ounce gold per ton.

The Olive Mine is presently owned by a partnership including A. LaFreniere and R. Pitkanen of Fort Frances. Recent exploration work includes stripping, trenching, and sampling.

Recent Activity

Companies involved in exploration in the Atikokan Program area include the following: Sherritt-Gordon Mines Limited which conducted geological, geophysical, geochemical, sampling programs, and trenching on several patented gold prospects and past-producers, including the Foley, Ferguson, and Manhattan Properties in the Mine Centre area.

Camflo Mines Limited continued gold exploration on the Elizabeth and Hill Lake Properties in 1982, with programs that included diamond drilling. Gold mineralization (visible) was intersected in diamond-drill core on both properties; however, the Exploration Division of Camflo Mines Limited is presently inactive.

Steep Rock Iron Mines carried out exploration work for gold and base metals in the Mine Centre and Atikokan areas. Exploration programs included geological mapping, geophysical, and geochemical surveys, and follow-up diamond drilling on the Transit-White Lake Property near Atikokan.

Nahanni Mines Limited continued exploration on the Sunbeam and Roy Properties, diamond drilling over 1500 m, and reported an intersection of 0.46 ounce gold per ton across a width of 1.8 m.

Mining North Explorations Limited continued exploration on the Lumby Lake base metal and gold property. Geophysical, geochemical, and geological programs were conducted. A new zinc occurrence (Cote Zinc Occurrence) hosted by felsic tuffaceous rocks was discovered. Further detailed geophysics and diamond drilling are being considered.

Fern Elizabeth Gold Exploration Company Limited carried out exploration on the Plator Gralouise, Hiawatha, and Smokey Occurrences, among other work. Exploration included stripping, trenching, sampling, and prospecting. Fern Elizabeth Gold Exploration Company Limited holds interest in both the Hill Lake and Elizabeth Properties presently optioned to Camflo Mines Limited.

Asamera Incorporated carried out exploration on the Jack Lake Prospect and Clearwater Occurrence. Exploration included detailed geological mapping, geophysical surveys, trenching, stripping, sampling, and prospecting. A diamond-drill program will commence in early 1983.

Noranda Exploration Company Limited carried out exploration on several properties in the Atikokan area. Detailed geological mapping, geophysical surveys, and diamond drilling was done.

Mattagami Lake Exploration Limited (Noranda) continued exploration work on the Band-Ore Gold Mines Limited option. Exploration consisted of diamond drilling programs, with results listed in the "Band-Ore Property" section in this report.

Greenwich Lake Exploration Limited and Lincoln Resources conducted exploration on the Frank West Option and surrounding property. Geological mapping, trenching, sampling, Induced Polarization, and magnetometer surveys, and diamond drilling were conducted. Diamond drilling intersected 0.33 ounce gold per ton across a width of 3 m (The Northern Miner, April 15, 1982).

Recommendations for Exploration

Base Metals

Numerous anomalies and targets for exploration are delineated on the airborne electromagnetic maps released by the Ontario Geological Survey for the Atikokan area (Ontario Geological Survey 1980).

Base-metal potential in the Lumby Lake, Finlayson Lake, Calm Lake, and Mine Centre areas should be further explored using these geophysical results.

Poulsen (1981) suggests the northern margin of the Grassy Portage Intrusion and the southeastern margin of the Seine Bay-Bad Vermilion Intrusion, as good exploration targets.

Recent exploration in the Lumby Lake Area resulted in the discovery of a narrow zinc zone hosted by felsic pyroclastic rocks. Further exploration in this area is warranted.

Ultramafic intrusions throughout the area should be re-examined and re-explored. Programs should determine the base metal and platinum group element content of these rocks.

Gold

Shebandowan-Shabaqua Area

Felsic metavolcanic units hosting oxide ironstone and chemical sedimentary rocks are excellent gold targets and should be researched, mapped, and sampled. Such environments possess large tonnage possibilities with mineralized zones amenable to geophysical surveys and diamond drilling programs. Townships including Lamport, Conacher, Duckworth, Blackwell, Laurie, Begin, Goldie, Horne, and the Dawson Road Lots, should be considered.

Metavolcanics near the Shebandowan Lake Stock may represent gold mineralization source rocks and should be explored emphasizing on structural controls, shear zones, and porphyries. Townships to consider are Conacher, Hagey, Haines, Being, Lamport, and Duckworth.

Geophysical (Induced Polarization and magnetometer) surveys and geochemical surveys are 2 useful tools in both environments.

Atikokan Area

Felsic plutonic rocks of the Marmion Lake Batholith and Contact Zone rocks should be explored with special emphasis on northeast-trending faults, shear zones, and sericite-chlorite-carbonate schists.

Felsic metavolcanic units and chemical sedimentary rocks in the Lumby Lake, Calm Lake, and Sapawe Lake areas should be further explored. Special emphasis on structural controls, carbonatization, and fragmental rocks should be considered.

Sulphide and oxide ironstone should also be sampled and assayed for gold, including the Atikokan Iron Formation, and the Lumby Lake, and Finlayson Lake ironstone units.

Mine Centre Area

Felsic plutonic rocks of the Bad Vermilion Intrusion and intermediate to felsic metavolcanics are excellent host rocks for gold-bearing vein systems. Special emphasis should be given to northwest- and east-trending shear zones.

Exploration programs in topographic lows and drift covered areas should be considered, using geochemical and geophysical (VLF, Induced Polarization, and magnetometer) surveys. Stripping, trenching, and bulk sampling should be fully utilized in order to attain two-dimensional control, and reduce the "nugget effect" of gold mineralization. Diamond drilling often tends to be misleading due to the erratic nature of the mineralization.

Gold-bearing vein systems occur in all rock types in the Mine Centre Area, with vein systems representing an epigenetic concentration due to hydrothermal activity produced during structural deformation. New genetic models and environments should be considered with chemical sedimentary rocks, pyroclastic rocks, ultramafic rocks, and reworked epiclastic metasediments representing primary gold mineralization source rocks.

Many of the gold properties in the Atikokan Program area were discovered in the 1800s and early 1900s. These properties should be re-evaluated and explored in conjunction with consideration being given to the concept of a centrally located mill.

Uranium

Uranium exploration activity in the North Central Region remained low keyed throughout the 1982 field season with only 3 major mining companies active in the area. The exploration operations of Gulf Minerals Canada Limited have been scaled down. Their uranium occurrences near Deadhorse Creek came open for staking. This showing was staked by John Ternowesky of Thunder Bay.

The 3 major companies engaged in uranium exploration in the North Central Region in 1982 were Uranerz Exploration and Mining Limited, Eldorado Nuclear Limited, and Saarberg-Interplan Canada Limited.

Saarberg Interplan Limited concentrated its efforts in the eastern section of McTavish Township where it has approximately 280 claims. The bulk of their claim group is located south of the old Enterprise Mine and the Dorion Amethyst Mine, both of which are uranium occurrences. During the 1982 field season, Saarberg Interplan Canada Limited conducted geochemical, geophysical, geological surveys, and trenching. Several likely diamond-drill targets have been delineated.

Uranerz Exploration and Mining Limited staked a uranium occurrence near Black Sturgeon Lake that was discovered by Richard Sutcliffe, geologist with the Ontario Geological Survey, in the 1981 field season. This is described by McIlwaine *et al.* (1982) under the heading "Split Rapids Dam Road Occurrence". Since then, Uranerz Exploration and Mining Limited has done considerable work on this property. Uranerz Exploration and Mining Limited conducted geophysical (electromagnetic, magnetometer, radiometric) and geological surveys on the claims. The main showing has been power stripped and all overburden in an area approximately 110 m by 40 m has been removed. The geology exposed in the stripped area consists of a conformable sequence of metamorphosed greywacke, ironstone, and volcanic rocks that have been intruded by pink radioactive pegmatites and a small diorite plug. The sequence has been faulted and many of the faults contain pitchblende and secondary uranium minerals. The widest radioactive zone is approximately 30 cm across; commonly these zones are only several cm wide. Grab samples taken by the Resident Geologist's staff assayed up to 0.49% uranium (Geoscience Laboratories, Ontario Geological Survey, Toronto). No diamond drilling was conducted on the property. The main showing has been trenched and the veins persist at least to the bottom of the pits.

A series of interesting old pits are located on the eastern side of the road approximately 7 km from Split Rapids Dam. These pits were excavated in quartz veins cross-cutting a metamorphosed ironstone. A grab sample of the garnetiferous ironstone yields an assay of 0.02 ounce gold per ton. This is significant because these rocks are on strike with the Beardmore-Geraldton Belt and should be evaluated for their gold potential. The reader is referred to the section describing exploration activity in the Beardmore-Geraldton area for suggestions on prospecting for gold in the extrusions of the Beardmore-Geraldton Belt, southwest of Lake Nipigon.

Uranerz Exploration and Mining Limited has another claim block that straddles the Purdom Township/McIvor Township boundary on the Frazer Lake Road. Work there consisted of geophysical and geological surveys coupled with power stripping. This occurrence has not been visited by office staff yet.

Eldorado Nuclear Limited conducted geophysical, geological, and geochemical surveys on their claim group in McTavish Township during the 1982 field season. Uranium occurrences near Greenwich Lake, Black Sturgeon Lake, Lake Helen, and Jessie Lake, as well as the Dorion Amethyst Mine and Good Morning Lakes Fault zone, were mapped and sampled as part of the Uranium Project initiated by this office in 1981. A detailed description of these and other occurrences will be included in the Uranium Project report.

Aggregate Resources

Aggregate Potential Maps

A primary thrust of the Ontario Ministry of Natural Resources with respect to the planning process has been the designation of aggregate lands in official plans for the purpose of protection from incompatible land uses (e.g. residental subdivisions). In this regard, aggregate potential maps of Oliver, Conmee, O'Connor, Blake, Pardee, Gorham, Ware, Dorion, and Nakina Municipal Townships were prepared by the Resident Geologist's staff. These maps represent a direct interpretation and compilation of available Quaternary geology and Northern Ontario Engineering Geology Terrain Study mapping, Ontario Ministry of Transportation and Communications sand and gravel inventory data, and the Ontario Ministry of the Environment water-well records. National Topographic System maps at a scale of 1:50 000 provide suitable basemaps. A limited program of ongoing field verification of the aggregate potential depicted by these maps is presently underway. These maps generally have been well received by the planning community because of the valuable geoscience input to the planning process.

Thunder Bay Area

There is a demand for detailed information concerning the quantity and quality of aggregate resources in the Thunder Bay area. During the past 1 to 2 years, requests were received from numerous individuals, from government and the private sector, to provide information about the quantity and quality of aggregate resources in the area, and assistance in locating sand and/or gravel deposits in resource-deficient areas.

Terrace Bay Area

A need for more detailed information regarding the sand and gravel resource base along the northern shore of Lake Superior in the Terrace Bay District has been identified. A field evaluation, similar to that conducted by Cowan (1976) at Marathon, of the aggregate potential of the Cavers (Gravel River), Terrace Bay, Jackfish Bay, Prairie River, and Neys granular deposits was initiated during the latter part of the 1981 field season. Field investigations at Terrace Bay, Jackfish Bay, and Neys have been completed by the Resident Geologist's staff. It is anticipated that field evaluation of the Cavers (Gravel River) and Prairie River areas will be completed during the 1983 field season. A map of the Quaternary geology, a derived map of the aggregate potential, and a brief summary statement describing the resource units comprising each granular source area may be published by the Ontario Geological Survey.

Clay Project

In 1982, Thunderbrick Limited requested assistance in locating a suitable clay for the manufacture of an extruded split-tile product. A brief literature search was conducted by the Resident Geologist's staff. Even though the locations of several suitable Ontario clay deposits were ascertained, it was nonetheless apparent that little was known about the nature and distribution of clay in the North Central Region. The major objective of this project is to increase the data base concerning clay deposits in the North Central Region.

Preglacial Clay

A literature search has revealed the location of several alumina-rich clay deposits (Maxwell *et al.* 1965) north of Kapuskasing in the Moose River Basin. The sediments comprise part of the Mattagami Formation of Mesozoic age, which includes "unconsolidated quartz sand with a kaolin matrix, containing lenticular beds of variously-coloured fireclays, and dark grey fireclay and interbedded lignite" (Guillet 1967). Guillet (1967) indicated that this "occurrence of Mesozoic sedimentary rocks in the Moose River basin is unique in Ontario." This comment poses a problem. These sediments represent erosion of a kaolinized granitic upland and subsequent deposition in an adjacent Mesozoic basin. The relationship between the process of kaolinization, the erosion of the residual kaolin deposit, and the deposition of derived sediment, represents the key to defining target areas characterized with a potential for kaolin clay. The possibility of recognising this relationship elsewhere in Ontario must also be considered. Guillet undoubtedly is correct in his assertion, at least to the extent that these deposits probably do not exist at this large scale elsewhere in the province. It is considered, however, that small scale, local deposits of alumina-rich sediment of Mesozoic age may exist elsewhere in Ontario, and specifically in Northern Ontario as outliers within shield terranes of Precambrian age.

For example, the Cargill Carbonate Complex (Sandvik and Erdosh 1977), situated approximately 87 km south of the Moose River basin, may partly comprise such an occurrence. Borehole data indicates that

an allogenic unit of preglacial overburden comprising "quartz sand, commonly containing wood chips, organic clay, and kaolinite ..." (Vos 1981) occurs overlying units of apatite-rich residuum and leached carbonatite. The similarity between the Moose River Basin silica sand and kaolinitic clay of Mesozoic age and the Cargill preglacial overburden unit may be significant. Therefore, another objective of the clay study is the determination and definition of the bedrock and structural controls responsible for these localized, but economically significant, sedimentary bodies. It is intended that delineation of the events responsible for the deposition and preservation of silica sand and kaolin clay at the Cargill Carbonate Complex will provide a framework within which programs of exploration for high alumina clay can be undertaken in the North Central Region. For example, the poşsibility that a similar depositional environment occurs associated with the Prairie Lake carbonatite is being considered.

Glacial Lake Clay

Northern Ontario Engineering Geology Terrain Study mapping was used as a basis for outlining areas of clay terrain. This mapping is quite explicit in the delineation of such terrain providing information on material, landform, topography, and drainage characteristics. Aerial photography of defined areas was examined to obtain the location of vertical sections suitable for field study. For example, the cut banks of streams flowing through areas of clay terrain can be located in this manner.

Section drawings, photographs, channel and hand auger samples were collected from 37 locations in the Thunder Bay and Nipigon areas. These samples were submitted to the Ontario Geological Survey's Geoscience Laboratories in Toronto for whole rock analysis. Selected samples were also submitted for x-ray diffraction analysis. Data concerning the chemical composition and mineralogy of these samples is forthcoming.

Ontario Geological Survey Activities

A.J. Macdonald (geologist with Mineral Deposits Section, Ontario Geological Survey) commenced a project on the relationship between gold deposits and chemical sediments. Most of this summer was spent by A.J. Macdonald in the Beardmore-Geraldton area, detailing the relationships of the ironstones to the gold-bearing structures.

R.H. Sutcliffe (geologist with Precambrian Section, Ontario Geological Survey) continued mapping the area around Lake Nipigon, outlining a number of ultramafic ring dike complexes and defining at least two major sills of Nipissing Diabase.

G. Beakhouse (geologist with Precambrian Section, Ontario Geological Survey) mapped Kirby Township, Fulford Township, and a part of McQuesten Township. The area is located to the north of Geraldton.

M. Jackson (geologist with Precambrian Section, Ontario Geological Survey) mapped the eastern half of the Lumby Lake area (30 km southwest of Upsala).

For further details, the reader is referred to Wood *et al.* (1982). Table 6 lists maps and reports published during this year by the Ontario Geological Survey, Ontario Ministry of Natural Resources.

TABLE 6 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Study 23 Report 218
27

Open File Reports

5326	5380	5389
5333	5382	
	5384	
	5388	

Preliminary Maps - Geological Series

P2528	2556	
2529	2557	
2530	2427	
2531		

Preliminary Maps - Data Series

P2512	2516	2520
2513	2517	2521
2514	2518	2522
	2519	

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

MP. 99

Geological Survey of Canada Open File Reports

Research by Other Organizations

Geological Survey of Canada

Activity by the Geological Survey of Canada included a metallogenetic study on the relationship of gold to ironstones in the Beardmore-Geraldton area by L. Anglin and J. Franklin. A regional geological compilation of Northwestern Ontario, emphasizing the granitic terrains, is being compiled by J. Percival.

Lakehead University

A wide variety of geological research is being carried out in the Thunder Bay region by staff and students at Lakehead University, Thunder Bay.

G. Borradaile
— Structure and Stratigraphy of the Calm Lake-Flanders-Factor Lake Area, Atikokan.

S. Kissin
— Genesis of Pegmatites in the Quetico Gneiss Belt and their Economic Significance.

M. Kehlenbeck
— Tectonic Evolution of Portions of the Quetico and Shebandowan-Wawa Subprovince in the Thunder Bay Area.
— Deformational Fabrics and Cleavage Development in Low-Grade Slates and Siltstones, Thunder Bay District, Ontario.
— Structure and Metamorphic Fabric of Rocks in the Dog Lake Area, Thunder Bay, Ontario.

R.H. Mitchell and R.G. Platt
— Petrology of the Coldwell Complex, Marathon (Mitchell and Platt 1982a, 1982b).
— Petrology of the Chipman Lake Complex, Geraldton.

H. Brown
— Structure of Certain Metasediments in the Shebandowan-Lappe Area (M.Sc. Thesis).

G. Clarke
— Petrology of the Eastern Margin of the Coldwell Peninsula, Coldwell Complex, Northwestern Ontario (H.B.Sc. Thesis).

M. Kennedy
— Mylonites of the Quetico Fault (M.Sc. Thesis).

G. Laws
— Petrology of Neys Lookout Area, Coldwell Complex, Northwestern Ontario (H.B.Sc. Thesis).

M. Stubley
— Structure of the Quetico Metasediments Near Macauly Lake (H.B.Sc. Thesis).

Recent publications include Platt and Mitchell (1982a, 1982b), Mitchell and Platt (1982a, 1982b), Borradaile and Poulsen (1981), and Kissin and Turner (1982). Recently completed theses include Jackson (1982), Cheadle (1982), Dubyk (1982), Clendining (1981), Dutka (1981), and Scott (1981).

Other Universities

Ersen, Cogulu
— Petrology of Great Lakes Nickel Deposit; University of Ottawa.

S. Wilkinson
— Platinum Group Metals in the Coldwell Complex; M.Sc.Thesis, Carleton University.

B. Cheadle
— Stratigraphy of Sibley Group; Ph.D., Queen's University.

J. Sequin
— Geology of Roxmark Property; H.B.Sc., Western University.

J. Teller
— Eastern Outlets of Lake Agassiz; University of Manitoba.

B. Phillips
— Geomorphology of Superior Shoreline; Department of Geography, Lakehead University.

Recent publications include Morton (1982) and Schnieders *et al.* (1981).

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1982 Report of the Timmins Resident Geologist

L.E. Luhta[1], and P.J. Sangster[2]

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[1]Resident Geologist, Ontario Ministry of Natural Resources, Timmins.
[2]Resource Geologist, Ontario Ministry of Natural Resources, Timmins.

Resident and Resource Geologists' Activities

Presently, staff at the Timmins office includes: W.O. Mackasey, Mineral Resources Coordinator; L.E. Luhta, Resident Geologist; P.J. Sangster, Resource Geologist; J. MacPherson, Core Library Geologist; and K. Burke, Secretary. In addition, B. MacRae is employed on a part-time basis to carry out geological compilations. D. Saunders and D. Draper were employed as summer assistants. R. Archibald, employed as a summer assistant for the Ontario Geological Survey, Geophysics/Geochemistry Section, was on loan part-time to the office as a draftsperson. M. Sasseville was employed this summer under the Experience '82 program.

Exploration activity in the area, especially for gold, was still at a high level and the staff spent much time in consultative duties. Emphasis was placed on examining and reporting on properties currently under exploration and development. Other activities included providing geological input to Land Use Plans and geological assessment of areas proposed as candidate parks and reserves. Also included in these activities were: conducting and attending geological field trips and tours, participating and organizing geological discussion group sessions, and presenting lectures on area geology to various touring groups.

With storage space at a premium this year, core was collected only in critical situations where absolutely necessary for its preservation. Even with this policy, drill core representing in excess of 15 800 m of diamond drilling was collected. In addition, the Resident Geologist's office is aware of thousands of metres of core available for donation to the planned Regional Core Library.

Diamond-drill core collected was drilled by the following companies: Gowganda Silver Company Limited; Gulf Minerals Canada Limited; Hygrade Corrugated Containers Limited; Kukatush Mining Syndicate; Mining Corporation-New Joburke Mine; Noranda Mines Limited; Rosario Resources Canada Limited/Lacana Mining Company Limited.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Rept. 199 Burntbush-Detour Lakes Area
Rept. 219 Geology of the Timmins Area

Open File Reports

OFR 5324 Mineral Potential Map of Ontario, Northwestern Sheet
OFR 5325 Mineral Potential Map of Ontario, Northeastern Sheet
OFR 5326 Mineral Potential Map of Ontario, West Central Sheet
OFR 5327 Mineral Potential Map of Ontario, East Central Sheet
OFR 5371 Uranium & Thorium Deposits of Northern Ontario
OFR 5376 Grant #30 - Regional and Local Patterns of CO_2 -K-Rb-As Alteration: A Guide to Gold in the Timmins Area
OFR 5382 Gold - Selected References
OFR 5390 Grant #27 - Field Relations and Geochemistry of Au, Ni and Cr Deposits in the Ultramafic-Mafic Volcanic Rocks
OFR 5391 Talc, Magnesite and Asbestos Deposits in the Kirkland Lake-Timmins Area.

Preliminary Maps Geological Series

P.2425 U and Th deposits of N. Ontario (N.W.sheet)
P.2426 U and Th deposits of N. Ontario (E.C.sheet)
P.2427 U and Th deposits of N. Ontario (W.C.sheet)
P.2500 Precambrian Geology of Keefer Twp.
P.2501 Precambrian Geology of Denton Twp.
P.2502 Precambrian Geology of Thorneloe Twp.
P.2534 Precambrian Geology of the Pensyl Lake Area

Coloured Maps

Map 2453 Burntbush Detour Lakes Area
Map 2455 Timmins

Geophysical Geochemical Series

Map 80536 to 80552 incl.
A.E.M. and Magnetic Survey Swayze Area

Mineral Resources Branch Publications

IPBP 2 Ontario Industrial Minerals

Miscellaneous Reports

MP 97 Genesis of Aechean Volcanic Hosted Gold
MP 98 G.R.G.P. Summary of Research 1980/81
MP 100 Summary of Field Work
MP 101 Annual Report of the Regional and Resident Geologists 1981

Claim Staking Activity

As of December 1982, over 5250 claims had been staked in the Porcupine Mining Division in 1982 compared to 8709 reported in 1981. The most active stakers in the Division were: Ingamar Explorations (Lower Detour Area and Rollo, Cunningham, and Swayze Townships); Gordon Leliever (Chester, Yeo, and Potier Townships); Peter Ferderber (Bayfield, Gourley, and Breckenridge Townships); and Cominco Limited (German and Stock Townships).

There are presently over 23 204 active claims in the Porcupine Mining Division as compared to 24 535 at this time last year. This represents approximately 928 000 acres of land being explored, not including work done on the numerous patented mining claims in the Division, and the areas covered by Exploratory Licences of Occupation.

Exploratory Licences of Occupation

Four companies now hold exploratory licences of occupation within the Cretaceous Basin. In 1980, Selco Incorporated was granted 243 000 acres, and the Ontario Energy Corporation 1 050 000 acres. In 1982, Selco Incorporated surrendered a part of their licence area, retaining 146 560 acres.

The Ontario Energy Corporation transferred their licence to Onexco Minerals Limited, a subsidiary company, and reduced their licence to 279 600 acres.

In 1981, Douglas Taylor Joint Venture and Lignasco Resources Limited were granted 10 400 and 92 745 acres respectively. No reductions in acreage have been made by these 2 companies.

Operating Mines

Base Metals

Although the actual 1982 figures are unavailable at the time of writing, the projected production at Kidd Creek Mines Limited for 1982 is 4 225 790 tonnes (3 247 150 tonnes from the Number 1 Mine and 978 640 tonnes from the Number 2 Mine). This is an increase from the 4 076 400 tonnes milled in 1981, which produced 109 200 tonnes of zinc metal, 60 400 tonnes of copper metal, 114 900 kg of silver, 483 tonnes of cadmium concentrates, 238 tonnes of tin concentrates, and 16 100 tonnes of lead concentrate.

The bulk of the production from the Number 1 Mine came from above the 1600-foot level with approximately half the ore coming from pillar recovery above the 1200-foot level. Most of the production from the Number 2 Mine came from above the 2800-foot level.

In 1982, development at the Number 1 Mine totaled 9281 m (6232 m of lateral and 3049 m of vertical development). At the Number 2 Mine, development totaled 10 156 m (7364 m of lateral and 2792 m of vertical development). This compares with the 1981 figures of 7266 m at the Number 1 Mine and 9985 m at the Number 2 Mine. Underground diamond drilling was 28 700 m with 9460 m being classified as exploratory drilling. This compares with the 1981 figures of 24 994 m and 5578 m respectively. Surface diamond drilling at the mine site totaled 2381 m.

The number of persons employed at Kidd Creek Mines Limited in mining and metallurgy in 1982, was 3050 people (Kidd Creek Mines Limited, personal communication, 1982).

Precious Metals

The $92 million expansion program, which was started at the Dome Mine in South Porcupine, is continuing. The new Number 8 Shaft planned to reach 5400 feet was at 3200 feet by the end of 1982. The shaft will be the deepest single shaft in the Timmins area, and is scheduled for completion in the summer of 1983. Grinding and crushing facilities have been completed in the mill to increase the throughput from 2000 tons to 3000 tons per day. In 1981, the company produced 557 200 tons at an average grade of 0.136 ounce gold per ton with a recovery of 96.9%. The 1982 production figures are unavailable at the time of writing; however, similar results are expected. The 1983 forecast is for a daily production rate of 2200 tons per day at the same grade.

A total of 18 692 feet of underground development was completed in 1982 (16 317 feet of lateral and 1325 feet of vertical) compared to 18 883 feet in 1981.

Diamond-drill footage totaled 45 000 feet compared to 38 456 feet in 1981. Of this, 41 000 feet was classified as stope and drift development drilling with 4000 feet classified as exploratory drilling. Underground drilling, totaling 5000 feet, was done for Augdome Corporation by Dome Mines Limited to explore the former company's property adjacent to the Dome Mine. Diamond drilling averaged 6 shifts per day with 5 machines.

Ore reserves by the end of 1981 were published as 2 146 716 tons at 0.207 ounce gold per ton compared to the 1980 figures of 2 149 500 tons at 0.206 ounce gold per ton. Dome Mines Limited has always kept 5 years of reserves in advance. The upcoming expansion will be attempting to increase these reserves.

There are 759 people employed by Dome Mines Limited at its South Porcupine operation, up from 741 a year ago (Dome Mines Limited, personal communication, 1982).

Due to the lower price of gold for 1982, Pamour Porcupine Mines Limited stopped the following operations: The Number Two Mine (Hallnor); The Canadian Arrow Open Pit; The copper zone and the Number 12 shaft at the Schumacher Division.

Pamour Porcupine Mines Limited's 1982 production figures are not yet available, however, it is estimated that the company will process 1 800 000 tons of ore at an average grade of 0.084 ounce gold per ton and 0.03% copper. Most of the ore will be mined from the Pamour Porcupine Mines Limited mines, with the balance being received from other companies on a custom milling basis. An approximate breakdown for the 1982 production is given below:

Schumacher Division (underground) 330 000 tons
Ross Division (underground) 250 000 tons
Timmins Property (open pit) 140 000 tons
Timmins Property (underground) 80 000 tons
Romfield (open pit) 18 000 tons
Canadian Arrow (open pit) 81 000 tons
Pamour Number 1 (underground) 630 000 tons
Pamour Number 3 (underground) 73 000 tons

Limited production (<10 000 tons) came from Pamour Number 2 (Hallnor underground), Matachewan Consolidated (open pit), Young Davidson (open pit), and Hoyle (open pit).

The following companies sent gold ore or concentrate to Pamour Porcupine Mines Limited for processing: Kidd Creek Mines Limited (Owl Creek Mine); Murgold Resources Limited; Goldlund Mines Limited; Brown McDade Mines Limited; Asarco Exploration Company of Canada Limited; Munro Croesus; and JRC. A total of 106 000 feet of underground diamond drilling was conducted at Pamour Porcupine Mines Limited's area mines. A minor amount of surface drilling was completed by the mine geology staff at Pamour Number 1.

At present (December 1982), there are 930 people employed by Pamour Porcupine Mines Limited compared to 1270 this time last year (Pamour Porcupine Mines Limited, personal communication, 1982).

The Owl Creek Gold Deposit, jointly owned by Kidd Creek Mines Limited (the operator) and Inco Limited (the discoverer), started production by open pit in November 1981. The pit is located at the western end of the deposit. Milling began in April 1982 at the metallurgical site of Kidd Creek Mines Limited and 98 000 tonnes were milled. Because of problems related to the graphite in the ore, an agreement was made with Pamour Porcupine Mines Limited to mill the ore at their Schumacher Division mill which was set up to handle graphitic ore at the Schumacher Division Mine. In 1982, a total of 250 000 tonnes was milled at both sites. Gold grade averaged 4.1 gm gold per tonne (0.13 ounce gold per ton). An estimated 942 000 tonnes of ore remain to be mined by open pit to the end of 1987.

A minor amount of underground development on the deposit, mostly at the eastern end, was done in 1982. This included 90 m of crosscutting, 75 m of drifting, and 118 m of ramping. There was 1400 m of

underground diamond drilling and no surface diamond drilling done in 1982. It is felt by company personnel that a higher gold price is needed before underground production will be considered at the deposit (the price of gold at the time of writing is approximately $440 U.S.) (Kidd Creek Mines Limited, personal communication, 1982).

Brown McDade Mines Limited carried out a minor amount of open pit production on its Denton Township Gold Property. An open pit cut from narrow veins and mineralized shear zones in mafic volcanics adjacent to a granitic intrusion produced 2634 tons at an average grade of 0.05 ounce gold per ton (Brown McDade Mines Limited, personal communication, 1982).

Industrial Minerals

Steetley Talc Limited has been offered a grant of up to $940 000 from the Government of Ontario through the Board of Industrial Leadership and Development (BILD). This grant is conditional on the parent company, Steetley Industries of Hamilton, committing sufficient interest-free funds to complete a $3.76 million expansion of the Timmins operations by 1985. This expansion can be considered as a series of small projects to bring the total production up to 36 000 tons of talc per year. It will include modifying the fine grind plant from a prototype to an actual production facility. Production in 1982 included the open pit mining and stockpiling of 73 150 tons of ore during the summer months, with 14 970 tons of waste being removed. The ore is mined and the talc concentrated in Penhorwood Township from a talc-magnesite altered ultramafic body. The ore contains approximately 28% recoverable talc. The concentrate is trucked to the company's fine grind plant in Timmins.

Steetley Talc Limited presently employs 40 people at its Timmins operations (Steetley Talc Limited, personal communication, 1982).

Property Evaluation and Development Projects

The Detour Lake Joint Venture, composed of Amoco Canada Petroleum Company Limited, Campbell Red Lake Mines Limited, and Dome Mines Limited, is scheduled to begin open pit mining their gold deposit, 200 km northeast of Timmins, in May 1983.

Stripping, which began in January 1982, has by December 1982 removed 500 000 m^3 of overburden and attained one third of the preproduction requirements. In 1982, the steel erection for the plant was completed and all buried services (pipelines, wiring) were installed. Presently, work is being done on the interior of the mill. Milling is to begin in August 1984. The 120 km part of the road to the mine site from Highway 652 undertaken by the Ontario Ministry of Transportation and Communications is 70% complete. The completion date is set for October 1983. The company's part of the road, 28 km southward from the deposit is almost finished. The heavy equipment and building materials reached the site this past winter over a winter road which originated north of LaSarre, Quebec.

A runway, 1000 m long, was built to accommodate Austin Airways' flights from Timmins. A 138 km, 115 kv transmission line is being constructed from the Ontario Hydro power grid near the Island Falls generating station.

The open pit is scheduled to produce 2500 tonnes per day or 912 500 tonnes per year and approximately 4 to 4.5 million tonnes will be mined by this method. The hoist selection and a decision on the underground method of mining will be made in 1983. The pilot hole for the shaft is to be started in 1984.

Published ore reserves are at the time of writing 27 733 000 tonnes at 3.88 gm gold per tonne (0.113 ounce gold per ton) down to the 550 m level. The deposit is still open to depth and to the west.

A total of 450 people were employed at the mine site last summer, which included 115 Detour Lake Joint Venture employees (Campbell Red Lake Mines, personal communication, 1982).

Asarco Exploration Company of Canada Limited spent $6 million for the underground exploration of its Aquarius Gold Deposit in Macklem Township from the end of 1981. The project is presently inactive; however, the underground workings are being pumped out and the shaft and hoist are being maintained. The shaft was sunk to 575 feet and 2600 feet of horizontal development was done. Underground diamond drilling, totaling 20 000 feet, was also completed. A test mill of 150 tons per day capacity was set up on the property, and 9000 tons of development ore were milled. A probable reserve figure of 280 000 tons at a grade of 0.22 ounce gold per ton was calculated. This figure could be expanded to 400 000 tons at 0.26 ounce gold per ton and classified as an indicated reserve. The host rock is described as a talcose carbonated ultramafic adjacent to a talc-chlorite schist. The gold is all free gold and 70% can be extracted in the jigs. The remaining gold is fine flour gold and is floated off with a pyrite concentrate.

The Kidd Creek Mines Limited Special Projects Department drilled 7 holes this summer as fill-in holes on the company's Hoyle Pond Gold Deposit in Hoyle Township. The deposit was discovered in 1980 with further exploration diamond drilling being done during 1980 and 1981 at 30 m centres. The next stage is to explore and obtain reserve information on the deposit by going underground. A long decline is proposed to reach the ore at 115 m below surface. Approval for the project is dependent on available funding.

Five mineralized veins or zones have been found striking N65° E, and dip vertically. Good diamond-drill

information is available to 160 m below surface, and the deposit is open to depth.

The host rock is a buff-grey carbonatized magnesium tholeiite having a sugary texture. Turbidites with a carbonaceous zone occur to the north and ultramafics occur to the south. The magnesium tholeiite strikes due east and is cut by a fracture zone which strikes obliquely to it. This zone contains graphite within the fractures and hosts the gold bearing quartz-tourmaline veins (personal observation of the authors, 1982; Kidd Creek Mines Limited, personal communication, 1982).

The joint venture program of Amax of Canada Limited and Dupont of Canada Exploration Limited on the Hoyle Township property of Broulan Reef Mines has outlined reserves of 500 000 tons grading 0.193 ounce gold per ton on the North Zone. Strike length is over 1300 feet and the vertical depth is 650 feet; the deposit being open to depth. Two drilling programs in 1982 totaling 25 000 feet in 45 holes were carried out mostly on this zone. On the Bell Creek Zone, 800 feet to the south, gold intersections have been obtained intermittently over a strike length of 1200 feet. Further drilling is required to assess this zone (Broulan Reef Mines Limited, News Release, November 10, 1982).

Murgold Resources Limited diamond drilled a total of 12 776 feet on its Chester Township Gold Property near Gogama in 1982; 8000 feet were put down on the Number 3 vein system. A new shaft was collared and is to be sunk to 350 feet for exploration and ore definition purposes. The shaft is located approximately 1500 feet west of the Number 2 Shaft (the old Strathmore Shaft). This project is under the direction of Watts, Griffis, and McOuat Limited. A 266 ton bulk sample taken from the Number 2 Shaft workings was milled (part at the Chester Township mill of Canadian Crest Gold Mines Limited and the remainder at the facilities of Pamour Porcupine Mines Limited in Timmins). The average grade for the sample was reported to be between 0.700 and 0.969 ounce gold per ton (Watts, Griffis, and McOuat Limited, personal communication; Northern Miner, September 23, 1982; G. Cross Newsletter, September 30, 1982).

Abitibi Price Incorporated completed 9 holes, totaling 5437 feet in length, in 1982 in Lucas and Tully Townships along the strike of the gold deposit which the company discovered in 1980. The discovery was a follow-up on an old Canico hole. Reserves were estimated at 235 000 tons at 0.10 ounce gold per ton. The mineralized zone is described as a black cherty rock containing quartz stringers and veins with pyrite. Two zones were discovered which looked identical; however, only one zone contained gold mineralization. The hanging wall rocks were described as felsic tuffs and fragmentals with black carbonaceous zones, and the footwall rocks were a carbonatized sericite schist. The deposit has a north dip (Abitibi Price Incorporated, personal communication, 1982).

Sulpetro Minerals Limited optioned the Rundle Gold Property in Newton Township from Hollinger Argus Limited in 1981, and worked on a road towards the property from the southeastern corner of Silk Township in 1982. A bulldozer was driven into the property from the end of the road which is yet to be completed, and a small amount of stripping and trenching was done (Sulpetro Minerals Limited, personal communication, 1982).

Gowganda Resources Incorporated completed a large amount of work on the old Carshaw Property in Shaw Township which the company acquired in 1981. In late 1981, a face was blasted to begin an open pit, which assayed 0.168 ounce gold per ton over 22 feet. During early 1982, a 5000-foot surface diamond-drill program was carried out. In the summer the underground workings were dewatered and access was achieved by the old 145-foot shaft. A sampling program and an underground drilling program were completed. A proven reserve of 167 000 tons at an average grade of 0.209 ounce gold per ton has been calculated and published by the company. The host of the gold mineralization is an iron formation (personal observations by the authors; Northern Miner, September 9, 1982; Northern Miner, October 14, 1982).

Rockwell Mining Corporation completed over 11 000 feet of diamond drilling on 2 zones in Chester Township between July 1981 and the end of January 1982. A small program was also done in September 1982. The gold-copper-silver assays are reported to be erratic, but are encouraging. The company is waiting for further financing before beginning additional drilling, bulk sampling, and possibly underground development (Gordon Leliever, President, Rockwell Mining Corporation, personal communication 1982; personal observation of the author, 1982; Northern Miner, August 12, 1982).

Diepdaume Mines Limited has completed dewatering the workings of the former Preston East Dome Mine to below 500 feet. The underground workings above this level are being studied with the plan of removing possible remaining ore by longhole methods. It has been announced that the company has commenced negotiations for the financing of a mill to process material from this operation and to provide a custom mill facility (Diepdaume Mines Limited, personal communication, 1982; Northern Miner, September 2, 1982).

Vedron Limited has been attempting to raise financing in order to proceed with the development of the Fuller Gold Property in Tisdale Township which is under option to Vedron Limited. The company has a joint venture agreement with Pamour Porcupine Mines Limited which would simultaneously develop the adjacent Romfield Property which it has under option (Northern Miner, July 22, 1982; Northern Miner, September 16, 1982).

Gowest Gold Resources Limited reported results of 1981 drilling in early 1982 on the former Halpenny

Gold Property in Denton Township. Three zones separated by a cross fault were intersected. Gold values were reported in all zones; however, additional exploratory work must be done to sufficiently evaluate the property. Plans are to have further work undertaken by a major mining company (Northern Miner, January 7, 1982).

Other Exploration and Development Activities

Sherritt Gordon Mines Limited optioned the interests of the International Minerals and Chemical Corporation (Canada) Limited in the Cargill Township Phosphate Deposit, but has not made a production decision due to current poor economic conditions. Results of a phos-acid test conducted by the company at their Fort Saskatchewan facilities, however, are reported to be very encouraging. The company is presently cutting a corridor to accommodate a road, railway, natural gas pipeline, and an electrical transmission line southward from Highway 11 near Harty to the property. A bulk sample of vermiculite was tested and met all the standards for use as a construction and insulating material. A feasibility study is presently being done on vermiculite production (Sherritt Gordon Mines Limited, personal communication, 1982).

Shell Canada Resources Limited continued exploration of the Martison Carbonatite Complex, 70 km north of Hearst. The complex was discovered by diamond drilling in 1981 following a recommendation published by the Ontario Geological Survey in an article written by R.P. Sage in its annual Summary of Field Work for 1979.

Work to date consists of airborne geophysical surveys, core drilling in 1981, and a total of 2954 m of sonic and reverse circulation drilling in 1982.

Geologically inferred reserve estimates of 140 000 000 tons of 20% P_2O_5; 0.35% Nb_2O_5; and as yet undetermined values in rare earth minerals have been released.

It has been learned that Shell Canada Limited has sold the Martison Lake Property, but further details of the transaction are not available at this time (Shell Canada Limited, personal communication, December 1982).

The Ontario Energy Corporation continued exploration of Licence Number 14889 in the Cretaceous Basin. Field work in 1982 consisted of a helicopter-supported drill program administered by Watts, Griffis, and McOuat Limited. Eighteen holes totaling approximately 7600 feet were drilled using a combination of reverse circulation and diamond drilling. Most of the drillholes were surveyed using wireline geophysics.

The program which ran from June to September 1982 was a "considerable success" with new lignite discoveries being made. In addition, some sampling of oil shales from the Long Rapids Formation was completed (Watts, Griffis, and McOuat, personal communication, 1982).

Selco Incorporated has had an extensive exploration program for the last few years drilling for kimberlite structures on staked ground and within their licence of occupation. An exploration agreement with Lignasco Resources Limited allowed Selco Incorporated to also explore within the former company's licence of occupation. The following diamond-drill holes were put down: 18 holes (1950 m total) were drilled in the James Bay Lowland north of Hearst; 2 holes (226 m total) were drilled in the North French River area; 9 holes (1234 m total) were drilled in the Smokey Falls-Coral Rapids area between the Mattagami and Abitibi Rivers; and 8 sonic holes (approximately 1000 m total) were drilled on Lignasco Resources Limited's area and on the Douglas Taylor Joint Venture exploratory licence. Drill targets were very shallow aeromagnetic anomalies, possibly indicating ultramafics piercing the Paleozoic rocks. Pyrope garnets were also found in the Coral Rapids area. Generally, brecciated ultramafic diatremes were intersected. These diatremes fit chemically and mineralogically into the lamprophyres of the alnoite and monchiquite range. No diatremes of kimberlitic affinity were discovered. The holes in the North French River intersected highly altered peridotites. The company feels that none of the above areas warrant further exploratory work for kimberlite and there are no immediate plans to return to the above areas. Plans for 1983 are for "grass roots" programs.

During March 1982, Selco Incorporated drilled 4 sonic drillholes for a total of 439 m on behalf of Lignasco Resources Limited. The drillholes were located within 800 to 1400 m of Ontario Geological Survey drillhole Number 78-06 in southwestern Sanborn Township. No significant lignite was observed in the drillholes of Lignasco Resources Limited. Silica sand, kaolinite, and fireclays were noted in the drill logs.

Extender Minerals drilled 1 hole on the former Peerless Canadian Explorations Barite Property on the southern side of Langmuir Township.

Exploration Activity

Even though a large number of companies reduced their exploration programs throughout the country in 1982, the activity in the Timmins Resident Geologist's area was still high. As in the previous 2 years, emphasis was placed on the exploration for gold deposits, with only a few companies (mostly the larger companies) exploring for base-metal deposits. Some of the projects carried out in the area for 1982 are described briefly.

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1.	Abitibi Price Inc.	diamond drilling, HEM and Mag surveys in Lucas Twp.
2.	Amax Minerals Exploration	diamond drilling in Calvert, Hoyle, Murphy and Ogden Twps.
3.	J. Arsenault	mechanical equipment and manual labour in Slack Twp.
4.	Augdome	diamond drilling in Tisdale Twp.
5.	Ed. Blanchard	stripping in Benneweiss Twp.
6.	E. J. Burns	manual labour in Neill Twp.
7.	H. D. Carlson	VLF surveys in Lamarche Twp.
8.	Cominco Ltd.	diamond drilling in Matheson Twp.; overburden drilling in Gowan and Hoyle.
9.	Dome Exploration Ltd.	diamond drilling in Aqaskaqou Lake, Ministik Creek and Newnham Creek Areas; diamond drilling in Deloro and Tisdale Twps. recce geological mapping in Newton, Dale and Coppell Twps.
10.	Dupont	diamond drilling in Hoyle.
11.	Extender Minerals Ltd.	diamond drilling in Langmuir Twp.
12.	Getty Oil	diamond drilling in Detour Lake Area.
13.	Global Energy Corp.	EM and IP surveys Detour Lake Area.
14.	Goldeidt	diamond drilling in Macklem Twp.
15.	Gowganda Silver	surface and underground diamond drilling in Shaw Twp.
16.	Granges AB	diamond drilling in Osway Twp.
17.	Hollinger Argus	diamond drilling in Denton and Stock Twps
18.	Home Oil Co. Ltd.	diamond drilling in Lucas and Crawford Twps.
19.	Inco (Canico)	diamond drilling in Tisdale Twp.
20.	Kennar Resources Ltd.	linecutting and EM surveys Lower Detour Lake Area.
21.	Kennco	geochemical and geophysical surveys and diamond drilling in Tisdale Twp.
22.	Kidd Creek Mines Ltd.	diamond drilling in Cody, Godfrey, Jamieson, Kidd and Matheson Twps
23.	V. L. Killeen	manual labour in Hassard Twp.
24.	Lacana	diamond drilling in Evelyn, Little and Tully Twps.
25.	D. Lalonde	stripping in Shaw Twp.
26.	L. Lefebvre	manual labour in Avon Twp.
27.	Lignasco	diamond drilling in Emerson, Kipling and Sanborn Twps.
28.	Mattagami Lake Exploration	diamond drilling and geophysical surveys
29.	D. Meunier	trenching in Tisdale Twp.
30.	Murgold Resources	diamond drilling in Chester and Benneweiss Twps.
31.	Nahanni Mines	diamond drilling in Reaume Twp.
32.	National Irron Resources	stripping in Benneweiss Twp.
33.	Newmont Exploration	diamond drilling in Tully, Prosser, Duff and Tisdale Twps. and in W. Sunday Lake and W. Hopper Lake Areas
34.	Noranda Exploration	diamond drilling in Horwood Twp.
35.	Omenica Resources	diamond drilling in Whitney Twp.
36.	Ontario Energy Corporation	overburden drilling James Bay Lowlands.
37.	Osway Exploration	geophysics, diamond drilling, trenching in Osway and Huffman Twps.
38.	Peat Resources	sampling in Moberly, Jessop, Thorburn, Wark, Gowan, Lucas and Duff Twps.
39.	Quinterra, Highland Crow Resources	overburden sampling Tooms and Greenlaw Twps.
40.	Rio Tinto Exploration	diamond drilling in Langmuir & Carman Twps.

TABLE 2 Continued

Number on Figure	Individual or Company	Activity
41.	Rockwell Resources	diamond drilling in Chester Twp.
42.	Romex Resources	diamond drilling in Tully & Prosser Twps.
43.	O. Robichaud	VLF and magnetometer surveys in Hoyle Twp.
44.	R. Rousseau	trenching and stripping in Price Twp.
45.	N. Ruttan	manual labour in McPhail Twp.
46.	J. St. Gelais	diamond drilling & manual labour in Deloro Twp.
47.	Samim Canada Ltd.	diamond drilling in Godfrey, Jamieson, Jessop & Little Twps.
48.	Selco Inc.	diamond drilling in S. Ridge Lake, W. Ridge Lake, S. Martison Lake Areas; sonic drilling and geological surveys in Kipling Twp.
49.	Shell Canada Resources	overburden drilling in Byrnes Lake Area; peat sampling in Shannon Twp.
50.	Shiningtree Resources	diamond drilling in Whitney Twp.
51.	Sulpetro	trenching and stripping in Newton Twp.
52.	Sulphide Syndicate	diamond drilling in Jamieson Twp.
53.	Surveymin Ltd.	diamond drilling in Reaume Twp.
54.	Westmin Resources	diamond drilling Detour Lake Area.
55.	P. J. Widowczyk	trenching and manual labour in Horwood Twp.

TABLE 3 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

AMag, AEM - airborne magnetometer survey
airborne electromagnetic survey
Au - gold
BH - borehole (numbers following "BH" indicate the number of holes and total length drilled respectively)
BM - Base Metals
Cu - copper
DD - diamond drill hole (numbers following "DD" indicate the number of holes and total length drilled respectively)
GL - Geological Surveys
GC - Geochemical Surveys or Studies
HLEM - Horizontal Loop Electromagnetic Survey
IP - Induced Polarization Survey
Mag - magnetometer survey
OVD - Overburden drilling (numbers following "OVD" indicate the number of holes and total length drilled respectively)
Res - Resistivity Survey
rTr - trenching
sTr - stripping
VLEM - vertical loop electromagnetic survey
VLF - very low frequency survey

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Adams Twp.	42A/6	Amax Minerals Expl Ltd.	-	Assess.	DD-6-405m, GL	1981	2.4302	T-1978
	42A/6SW	Pyke,D.R., Property	-	Assess.	OVD-31-304 ft.	1981	2.4549	T-2458
Agaskagou Lake Area	42I/1NW	Dome Exploration Canada Ltd.	Au	Assess.	Mag, HEM, DD-8-2951 ft.	1981 1982	2.3984, 2.3985	T-2406
Atkinson Lake Area	32E/13SE, 32E/13NE	Getty Canadian Metals Ltd.	Au	Assess.	AMag.	1981	2.4292	T-2443
	32E/13SE	Hudbay Mining Ltd.	Au	Assess.	AEM	1980	2.3932	T-2391
Avon Twp.	42H/13SE	Lefebvre, L. Prop.	-	Assess.	Manual labour	1982	-	T-2340
Bartlett Twp.	42A/3NE, 42A/3NW	Amax Minerals Expl Ltd.	-	Assess.	AEM	1981	2.4291	T-2416
Benneweiss Twp.	41P/12SE	Blanchard, E.D., Prop.	Au	Assess.	rTr	1982	-	T-2475
	41P/12SW	Murgold Resources	Au	Assess.	DD-4-622 ft.	1982	-	T-2433
	41P/12SW	National Irron Resources Inc.	Au	Assess.	sTr	1982	-	T-2476
Bond Twp.	42A/7NE	Hollinger Argus Ltd.	-	Assess.	DD-1-450 ft.	1982	-	T-2409
	42A/7NE	Westmin Resources Ltd.	-	Assess.	Mag, HEM	1981	2.3938	T-2440
Bristol Twp.	42A/5NE	Canadian Gold and Metals Inc.	Au	Assess.	OVD-34-436 ft.	1981	2.4584	T-2366
	42A/5SE	Preussag Canada Ltd.	-	Assess.	Mag, VLF, HEM, DD-11-2371 ft.	1981	2.3973	T-2378
	42A/5NE	Tagalder Resources	-	Assess.	OVD-152-2974 ft. AEM	1981	2.4489 2.3752	T-2456 T-2366
	42A/5	Texasgulf Canada Ltd	-	Assess.	OVD-20-849 ft.	1981	-	T-1941
Byng Twp. & Puskuta Twp.	42B/13NE	Amax Minerals Expl. Ltd.	-	Assess.	AMag	1981	2.4286	T-2473
Byrnes Lake Area	42J/5SE	Selco Inc.	diamonds	Assess.	DD-1-109m, mag,DD-9-901 ft.	1980 1981	2.3793	T-2319 T-2384 T-2350
	42J/5	Shell Canada Resources Ltd.	phosphate	donated	OVD-1-84m	1982	-	T-2468
Carman Twp.	42A/6	Amax Minerals Expl.	-	Assess.	AEM, AMag, GL	1981	2.4304 2.4198 2.4331	T-1978
	42A/6SE	Rio Tinto Canadian Exploration Ltd.	-	Assess.	DD-1-113m	1982	-	T-2454
Carnegie Twp.	42A/14SW	Mattagami Lake Expl Co. Ltd.	-	Assess.	IP, Res	1981	2.4142	T-2353
	42A/14SW	Rosario Resources	-	Assess.	Mag, HEM	1981	-	T-2336
Carscallen Twp.	42A/5NE	Tagalder Resources	-	Assess.	AEM	1981	2.3752	T-2366
	42A/5NE	Texasgulf Canada Ltd	-	Assess.	OVD-28-2062 ft.	1981	-	T-1941
Chabbie Lake Area	32E/12SW	Dome Exploration Canada Ltd.	Au	Assess.	EM, Mag	1981	2.3986	T-2395
	32E/12S	Hudbay Mining Co. Ltd.	Au	Assess.	AEM	1980	2.3931	T-2390

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Chester Twp.	41P/12SW	Canadian Crest Gold Mines Ltd.	Au	Assess.	DD-2-1344 ft.	1981	2.2731	T-1751
	41P/12SW	Johnway Resources Inc.	Au	Assess.	sTr	1981	-	T-2383
	41P/12SW	Kidd Resources Inc.	Au	Assess.	sTr	1981	-	T-2388
	41P/12SW	Lytle,K.L., Prop.	Au	Assess.	DD-4-222 ft.	1981	-	T-1934, T-1969
	41P/12SW	Murgold Resources	Au	Assess.	DD-12-4138 ft.	1982	-	T-2433
	41P/12SW	#466738 Ontario Ltd.	Au	Assess.	DD-1-690 ft.	1981	-	T-2355
Denton Twp.	42A/5SE	Brown McDade Mines Ltd.	Au	Assess.	Mag, VLF	1980	2.3842	T-1991
	42A/5SE	Gambit Consolidated Exploration	-	Not Assess. Assess.	prospectus DD-2-800 ft.	1981	-	T-1865
	42A/5SE	Hollinger Argus Ltd	-	Assess.	DD-2-333 ft. VLF	1981	2.3975	T-2412
Denyes Twp., Dore Twp.	41O/15SE	Canico	-	Assess.	Mag, ra, AEM	1981	2.4576	T-2446
Douglas Twp.	42A/6SE	Noranda Exploration	-	Assess.	Mag, HEM	1981	-	T-2437, T-2462
Dublin Twp.	41P/4SE	Young, J.R. Prop.	-	Assess.	rTr, sTr	1982	-	T-2464
Duff Twp.	42A/14SE	Abitibi Price Inc.	-	Assess.	OVD-11-1037 ft. Mag, HEM	1981	2.4143, 2.4164	T-2441, T-2444
	42A/14SE	Canico	-	Assess.	GL	1981	2.4272	T-1979
	42A/14E	Newmont Exploration of Can. Ltd.	-	Assess.	DD-2-1827 ft. DD-3-1750 ft.	1981	-	T-2404, T-2451
Dyer Twp.	42I/NW	Selco Inc.	-	Assess.	Summary of Exploration	1981	-	T-2408
East Squirrel River Area	42J,K	Selco Inc.	diamonds	Assess.	DD-9-901 ft.	1980	-	T-2350
Eldorado Twp.	42A/6	Amax Minerals Expl	-	Assess.	GL	1981	2.4302	T-1978
Emerson Twp.	42J/1NE	Lignasco Resources Ltd.	lignite	Not Assess.	Coal Conversion Report	1981	-	T-2413
Esther Twp.	41O/9NW	Burton,M.L. Prop.	-	Assess.	Manual labour	1981	-	T-1920
Evelyn Twp.	42A/10,11	Rosario Resources and Lacana Mining Corp.	-	Assess.	OVD-31-5241 ft. OVD-31-5238 ft. DD-4-2455 ft.	1981 1982	-	T-1946
Fallon Twp.	42A/3NE	Noranda Exploration	-	Assess.	Mag, HEM	1981	2.4426	T-2455
	42A/3	Wright, R.J. Prop.	-	Assess.	Mag, Seismics	1980	2.3693	T-1995
Farquhar Twp.	42F/8SE	Haavaldsrud. O., Prop.	-	Assess.	DD-2-430 ft.	1981	-	T-2310
Fox River and North Fox River Areas	42J,K	Selco Inc.	diamonds	Assess.	DD-1-73m	1980	-	T-2379
Fripp Twp.	42A/3NE, NW	Amax Minerals Expl	-	Assess.	AEM	1981	2.4291	T-2416
	42A/6SW	Argentex Resources Exploration Ltd.	-	Assess.	mech. equip,rTr	1981	-	T-2431
Foleyet Twp.	42B/1NW	Hudbay Mining Co. Ltd.	-	Assess.	AMag	1980	2.4253	T-2349
Geary Twp.	42A/12,13, 14	Gulf Minerals Can. Ltd.	-	Assess.	Mag, AEM	1981, 1980	2.4138 2.781	T-2367 T-1929
German Twp.	42A/10SW	Asarco Exploration Co. of Can. Ltd.	Au	Assess.	Mag. OVD-22-4162 ft.	1980 1981	2.4478, 2.3608	T-1959
	42A/10SW	Pyke,D.R., Prop.	Au	Assess.	Mag.	1981	2.4279	T-2466
Genoa Twp.	41O/16SW	Falconbridge Ltd.	-	Assess.	Manual labour VLF,DD-3-1140 ft., assays.	1981	2.4166	T-2345
Godfrey Twp.	42A/5NE	Kidd Creek Mines Ltd	-	Assess.	DD-2-642m Mag,HEM,VLF,sTr	1982, 1981	- 2.4334	T-1867 T-2470

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
	42A/5NE	Samim Canada Ltd.	-	Assess.	DD-1-125 ft.	1982	-	T-2461
	42A/5NE	Tagalder Resources	Au	Assess.	AEM,Basal till sampling	1981	2.4489	T-2456, T-2366
Gowan Twp.	42/11NE	Cominco Ltd.	Au	Assess.	OVD-6-596 ft.	1982	-	T-2414
	42A/11NE	Lacana Mining Corp.	Au	Assess.	Mag., HEM	1980	2.3750	T-1805
Greenlaw Twp.	410/10NW	Granges Expl. AB	-	Assess.	DD-5-1153 ft.	1981	-	T-1997
Halcrow Twp.	410/15SW	Sulpetro Minerals Ltd.	-	Assess.	GL	1981	2.4306	T-2472
Hamlet Twp.	42I	Selco Inc.	diamonds	Assess.	DD-1-76m	1981	-	T-2371
Hanna Twp.	42A/14NE	Carlson,H.D. Prop.	-	Assess.	VLF	1980, 1981	2.4373	T-2471
Hassard Twp.	42A/4SE	Killeen, V.L.	-	Assess.	Manual labour	1982	-	T-1937
Heath Twp.	42I	Selco Inc.	diamonds	Assess.	DD-1-76m	1981	-	T-2371
Hecla Twp.	42I/5,6	Selco Inc.	diamonds	Assess.	Summary of Exploration	1981	-	T-2408
Heenan Twp.	410/16SW	Falconbridge Nickel Ltd.	-	Assess.	DD-3-1512 ft., VLF, Manual labour	1981	2.3744 2.4165 2.4166 2.4515	T-2345
Hobson Twp., Hogg Twp.	42I/5,6	Selco Inc.	diamonds	Assess.	Summary of Exploration	1981	-	T-2408
Hopper Lake Area	32E/13NW	Dome Exploration Ltd.	Au	Assess.	HEM, Mag.	1980, 1981	2.3815	T-2392
	32E,32L	Westmin Resources Ltd.	Au	Assess.	OVD-88-9062 ft.	1981	2.4285	T-2331
	32L/4SW	Newmont Exploration	Au	Assess.	DD-10-1234m	1982	-	T-2457
Horwood Twp.	42B/1SW	Noranda Exploration Co. Ltd.	-	Assess.	DD-2-208 ft. DD-1-497 ft.	1980, 1982	- -	T-1688
	410/16NW, 42B/1SW	Kennco Exploration Ltd.	-	Assess.	AEM, AMag.	1981	2.4163	T-2469
	42B/1SW	Orofino Mines Ltd. Northgate Expl.	-	Assess.	A.Photography	1980	2.4011	T-2126
	42B/1SW	Terrell,M. Prop.	-	Assess.	GL,GC,rTr, Manual labour	1981	2.3720	T-2322
	410/16NW	Widowcyzk, R.J.Prop	-	Assess.	rTr, Manual labour	1982	-	T-2424
Hoyle Twp.	42A/11	Amax Minerals Expl	Au	Assess.	DD-1-201m, GL	1982, 1980	2.4148	T-2403 T-1928, T-2474
	42A/11SE	Gold Shield Synd. Omab Enterprises Ltd	Au	Assess.	DD-2-700 ft.	1981	-	T-1975
	42A/11SE	Robichaud, E.O. Prop.	Au	Assess.	VLF, Mag.	1982	2.4601	T-2425
Huffman Twp.	410/9NE	Osway Exploration Ltd.	Pb,Zn,Au	Assess.	DD-11-2756 ft.	1982	-	T-2452
Hurdman Twp.	42H/12	Mattagami Lake Expl Co. Ltd.	-	Assess.	DD-1-433 ft. DD-8-2837 ft.	1981	-	T-1972
Jamieson Twp.	42A/12SE, /12NE	Kidd Creek Mines Ltd	-	Assess.	sTr, Mag, HEM, VLF	1982, 1981	-	T-2470
	42A	Norcen Energy Resources Ltd.	-	Assess.	Mag,HEM,AEM	1981, 1979	2.4311 2.4029	T-1966
	42A/12SE	Samim Canada Ltd.	-	Assess.	DD-2-349m	1982	-	T-2460
	42A/12	Sulphide Syndicate	-	Assess.	DD-2-261m	1982	-	T-1936
Jessop Twp.	42A	Norcen Energy Resources Ltd.	-	Assess.	Mag, HEM, AEM	1981, 1979	2.4032 2.4033 2.4311	T-1966
	42A/11SW	Samim Canada Ltd.	-	Assess.	Mag, HEM DD-2-549m, DD-3-1449 ft.	1982	2.4031 -	T-2415, T-2416

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
	42A/11SW	Texasgulf Canada Ltd.	-	Assess.	Mag, HEM	1981	2.4181	T-2477
Keith Twp.	42B/1NW	Dome Exploration Co.Ltd.	-	Assess.	HEM, Mag. DD-3-1514 ft.	1981	- 2.4427	T-2338 T-2465
	42B/1NW	Hudbay Mining Co. Ltd.	-	Assess.	AMag	1980	2.4253	T-2340
Kidd Twp.	42A/11NW	Kidd Resources Inc.	-	Assess.	VLF, Mag	1981	2.4091	T-2435
	42A/11NW	Kidd Creek Mines Ltd.	-	Assess.	HEM, Mag	1981	2.3791	T-2385
Kilmer Twp.	42I-5SE	McKinnon, D.,Prop	-	Assess.	Mag.	1981	-	T-1445
	42I/NW	Selco Inc.	-	Assess.	Summary of Exploration	1981	-	T-2408
Kipling Twp.	42J/1NW	Liqnasco Resources Expl.Lic.1489@	lignite	Not Assess. Assess.	Coal Conversion Report DD-4-439m	1981 1982	- -	T-2413
	42J/1NE	Selco Inc.	diamonds	Assess.	Sonic drilling-2-199m, GL	1982	-	T-2427
Lamarche Twp.	42A/14NE	Carlson,H.D.,Prop	-	Assess.	VLF	1982	2.4159	T-2449
Langmuir Twp.	42A/6	Amax Minerals Expl	-	Assess.	GL	1981	2.4302	T-1978
	42A/7SW	Extender Minerals of Canada	barite	Assess.	DD-1-168 ft.	1982	-	T-1894
	42A/6SE	Rio Tinto Canadian Expl. Ltd.	-	Assess.	DD-11-113m	1982	-	T-2454
	42A/6SE	Seaway Copper Mines Ltd.	-	Not Assess.	Prospectus	1980	-	T-659
	42A/6SE	Utah Mines Ltd.	-	Assess.	Mag.	1980	2.3771	T-1808
Lennox Twp.	42A/14NW	Hudbay Mining Co. Ltd.	-	Assess.	DD-2-267 ft.	1981	-	T-2398
Little Twp.	42A/10/11	Lacana Mining Corp.	-	Assess.	DD-4-2455 ft. OVD-31-5238 ft.	1982, 1981	- 2.4463	T-1946
	42A/15SW	Norcen Energy Resources Ltd.	-	Assess.	Mag, HEM	1981	2.4028 2.4010	T-1966, T-2438
	42A/15SW	Samim Canada Ltd.	-	Assess.	DD-4-495m	1982	-	T-2418
Lizar Twp.	42C	Sveinson-Way Prop.	-	Assess.	GC DD-18-4265 ft.	1980	2.3947	T-1964
Lower Detour Lake Area	32E, L	Dome Expl. Co.Ltd.	-	Assess.	HEM, Mag	1981	2.4206	T-2447
	32E/13SE, NE	Getty Canadian Metals Ltd.	-	Assess.	AMag	1981	2.4292	T-2443
	32E,32L	Westmin Resources Ltd.	Au	Assess.	GL,OVD-88-9062 ft.	1981	2.4333 2.4134 2.4134 2.4285	T-2331
Loveland Twp.	42A/12,13, 14	Gulf Minerals Canada Ltd.	-	Assess.	AEM	1980	2.3781	T-1929
Lucas Twp.	42A/14SW	Abitibi Price Inc.	-	Assess.	HEM, Mag	1982	2.4071	T-2442
	42A/14SE	Canico	-	Assess.	GL	1981	2.4271	T-1977
	42A/14S	Home Oil Co.Ltd.	-	Assess.	DD-2-862 ft.	1982	-	T-2411
Macdiarmid Twp.	42A	Norcen Energy Resources Ltd.	-	Assess.	Mag, HEM DD-1-184m	1981	2.3943 2.3974 2.3961	T-1966
Macklem Twp.	42A/10SW	Asarco Expl. of Can. Ltd.	Au	Assess.	Mag,OVD-22-4162 ft.	1980	2.3068, 2.4479	T-1959
	42A/7	Dome Expl. Co.Ltd.	-	Assess.	Mag, HEM	1981	2.4084	T-2401
Mahaffy Twp.	42A/12,13, 14	Gulf Minerals Can. Ltd.	-	Assess.	AEM	1980	2.3781	T-1929

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Mann Twp.	42A/14NE	Carlson,H.D.Prop.	-	Assess.	VLF	1980,81	2.4373	T-2471
	42A/15SW	Norcen Energy Resources Ltd.	-	Assess.	Mag, HEM	1981	2.4010	T-2438
Marion Twp.	410/16SW	Falconbridge Nickel Ltd.	-	Assess.	VLF, HEM Manual labour, DD-3-1512 ft.	1980 1981	2.3744	T-2345
Martison Lake Area and So. of Martison Lake Area	42J	Selco Inc.	diamonds	Assess.	Mag,DD-1-74m DD-1-111m	1981	2.4022	T-2407, T-2450
Matheson Twp.	42A/10	Cominco Ltd.	-	Assess.	OVD-14-574m DD-1-128m	1982	-	T-2403
	42A/11SE, 42A/10SW	Kidd Creek Mines Ltd	-	Assess.	Mag, HEM, DD-2-671m	1981, 1982	2.3906	T-1984
McArthur Twp.	42A/3E	Amax Minerals Expl	-	Assess.	AEM	1981	2.4291	T-2416
	42A/3NW	Lacana Mining Corp.	-	Assess.	VLF	1981	2.4283	T-2467
McCart Twp.	42A/15SW	Norcen Energy Resources Ltd.	-	Assess.	Mag, HEM	1981	2.4010	T-2438
McPhail Twp.	410/NE	Ruttan,N. Prop.	-	Assess.	Manual labour	1982	-	T-2333
Ministik Creek Area	41I/1SW	Dome Expl.Co. Ltd.	-	Assess.	HEM, Mag, DD-1-357 ft.	1981	2.3983	T-2421
Minnipuka Twp.	42B/13	Amax Minerals Expl	-	Assess.	AEM, AMag	1981	2.4030	T-1961
Morrow Twp.	42I/5,6	Selco Inc.	diamonds	Not Assess.	Summary of Exploration	1981	-	T-2408
Murphy Twp.	42A/11SW	Pyke, D.R.Prop.	-	Assess.	OVD-4-205 ft.	1981	2.4305	T-2429
	42A/11	Rosario Resources Canada Ltd./ Amax Minerals Expl.	Au	Assess.	DD-1-201m	1982	-	T-1928
Muskego Twp.	42B/11NW	Dome Expl.Co. Ltd.	-	Assess.	HEM, Mag.	1981	2.4427	T-2465
Neill Twp.	410/5SE	Burns,E.J. Prop.	-	Assess.	Manual labour	1982	-	T-2463
Newnham Creek Area	42I/1SE	Dome Expl.Co. Ltd.	-	Assess.	HEM, Mag. DD-1-357 ft.	1982, 1981	2.3982 2.3981	T-2422
Newmarket Twp.	42A/15SW	Norcen Energy Resources Co. Ltd.	-	Assess.	HEM, Mag	1981	2.4010	T-2438
North Ridge Lake Area	42J/[illegible]	Selco Inc.	diamonds	Assess.	Mag., Mech. Equip. DD-1-169m	1982 1981	- 2.4022	T-2379 T-2407 T-2376
Ogden Twp.	42A/6	Amax Minerals Expl.	-	Assess.	GL,DD-6-1278m	1981	2.4343, 2.4332, 2.4339	T-1978
	42A/6NW	Surveymin Ltd.	-	Assess.	Mech.Equip.	1981	-	T-2321
Ophir Twp.	42I/5,6	Selco Inc.	diamonds	Not Assess.	Summary of Exploration	1981	-	T-2408
Osway Twp.	410/9NW	Kerr Addison Mines Ltd.	-	Assess.	Mag, IP, GL,VLF	1979, 1980	2.3363	T-2354
	410/9NE	Osway Exploration Ltd.	-	Assess.	DD-11-2756 ft.	1982	-	T-2452
Pearce Twp.	42G/9W	Kapuskasing Resources	-	Assess.	Ra,IP,Res	1981	2.4076 2.4502	T-2326
Penhorwood Twp.	42B/1NE	Steetley Talc Ltd.	-	Assess.	Manual labour	1982	-	T-1985
	42A/5NW	Tremblay,R. Prop.	-	Assess.	Manual labour	1981	-	T-1940
Pickett Twp.	42I/5,6	Selco Inc.	diamonds	Not Assess.	Summary of Exploration	1981	-	T-2408
Pivabiska River Area	42J	Selco Inc.	diamonds	Assess.	Mag, DD-9-901ft.	1981 1981	2.3793	T-2384 T-2350
Price Twp.	42A/6SW	Argentex Resource Exploration Ltd.	-	Assess.	Mech. Equip. rTr	1981	-	T-2431
	42A/6SW	Rousseau,R. Prop.	-	Assess.	sTr,rTr, Manual labour	1981, 1982	-	T-2423
Prosser Twp.	42A/14SE	Abitibi Price Inc.	-	Assess.	OVD-20-1998 ft. DD-2-1714 ft.	1981	2.3963 2.4164	T-2344

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
	42A/11NE	Hunkin,P. Prop.	-	Assess.	HEM, Mag	1980-1	2.3863	T-2434
	42A/11NE	Placer Development Ltd.	-	Assess.	AEM	1981	2.4217	T-2426
Rapley Twp.	42I/5,6	Selco Inc.	diamonds	Not Assess.	Summary of Exploration	1981	-	T-2408
Reaume Twp.	42A/14NE	Surveymin Ltd.	-	Assess.	Mag. HEM, DD-3-1584 ft.	1981, 1982	2.4015	T-2361
Reeves Twp.	42B/1NE	Kidd Creek Mines Ltd	-	Assess.	Mag., VLF	1981	2.4262	T-2459
	42B/1NE	Steetley Talc	-	Assess.	Manual labour	1982	-	T-1985
	42A/5NW	Tremblay,R. Prop.	-	Assess.	Manual labour	1981	-	T-1940
Reid Twp.	42A/12,13, 14	Gulf Minerals Canada	-	Assess.	AEM	1980	2.3781	T-1929
Ridge Lake Area	42J/1NW	Selco Inc.	-	Assess.	Mech.Equip. DD-1-137 ft. DD-4-479m Mag.	1981	- - -	T-2397 T-2368 T-2407
	42J/6SW	Shell Canada Resources	-	Assess.	AEM, AMag	1981	2.3998	T-2405
North Ridge Lake Area	42J	Selco Inc.	diamonds	Assess.	Mag, DD-2-175m Mech. equip.	1980	2.4022	T-2407 T-2376 T-2379
South Ridge Lake Area	42J	Selco Inc.	diamonds	Assess.	Mag.,DD-7-775m	1981	2.4022	T-2407
	42J/6SW	Shell Canada Resources	-	Assess.	AMag, AEM	1981	2.3998	T-2405
Robb Twp.	42A/12	Sulphide Syndicate	-	Assess.	DD-6-843m	1982	-	T-1936
Rollo Twp.	41O/15SE	Canico	-	Assess.	Mag,Ra, AEM	1981	2.4576	T-2446
Sanborn Twp.	42J/1NE	Lignasco Resources	-	Not Assess.	Coal Conversion Report, DD-4-439m	1981	-	T-2413
Shaw Twp.	42A/6	Amax Minerals Expl	-	Assess.	GL,DD-6-405m	1981	2.4332, 2.4339	T-1978
	42A/6NE	Hollinger Argus	-	Assess.	Mag, GL	1981 1980	2.4252 2.4375 2.4376	T-1999 T-2315
	42A/6NE	Lalonde,D., Prop.	-	Assess.	DD-3-175 ft., rTr, assays, Manual labour	1981	-	T-2396
	42A/6NE	Pamour Porcupine Mines Ltd.	-	Assess.	GL	1980	2.4148	T-2474
Sheraton Twp.	42A/7SE	Johns Manville Canada Inc.	-	Assess.	Mech. Equipt.	1981	-	T-1856
Shetland and Staunton Twps.	42G/6NW	Villeneuve, M.Prop.	-	Assess.	Manual labour	1981	-	T-1500
Sigal Lake Area	32E/12S	Hudbay Mining Ltd.	-	Assess.	AEM	1980	2.3931	T-2390
Slack Twp.	42G/1SW	Arsenault, J.	-	Assess.	Mech. Equipt. Manual labour	1982	-	T-2363
South Martison Lake Area	42J/6	Selco Inc.	diamonds	Assess.	Mag,DD-1-111m	1982	-	T-2450
South Ridge Lake Area	42J,K	Selco Inc.	diamonds	Assess.	DD-4-479m DD-7-775m	1982	-	T-2368 T-2407
Stock Twp.	42A/7NE	Hollinger Argus Ltd	Au	Assess.	DD-2-1326 ft.	1982	-	T-1960 T-2409
	42A/10NE	Montclerg Mines Ltd.	-	Not Assess.	Prospectus	1980	-	T-248
Sunday Lake Area	32E,32L	Westmin Resources Ltd.	Au	Assess.	OVD-88-9062 ft.	1981	2.4016, 2.4285	T-2331
Swayze Twp.	41O/15SE	Canico	-	Assess.	Mag, Ra, AEM	1981	2.4576	T-2446
	41O/15SE	Falconbridge Nickel Ltd	-	Assess.	Mag	1981	2.4386	T-2329

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Taylor Twp.	42A/10NE	Montclerg Mines Ltd	-	Not Assess.	Prospectus	1980	-	T-248
Thomas Twp.	42A/7	Dome Exploration Co. Ltd.	-	Assess.	Mag, EM	1981	2.4084	T-2401
	42A/7SW	Mattagami Lake Exploration Co.	-	Assess.	GL	1980, 1981	2.3858	T-2394
Thorburn Twp.	42A/12,13, 14	Gulf Minerals Can.	-	Assess.	AEM	1980	2.3781	T-1929
Thorneloe Twp.	42A/5SE	Preussag Can. Ltd.	-	Assess.	Mag,VLF, HEM DD-11-2371 ft.	1981	2.3973	T-2378
	42A/6SW	Pyke, D.R. Prop.	-	Assess.	GC,OVD-70-1587 ft.	1981	2.4239 2.4238, 40	T-2428
Timmins Twp.	42A/7SE	Johns Manville Canada Inc.	-	Assess.	Mech. Equipt.	1981	-	T-1856
Tisdale Twp.	42A/11SE	Allerston,R.E.Prop	-	Assess.	DD-2-850 ft.	1981	-	T-2393
	42A/11SW	Ingex Holdings and Development Ltd.	-	Assess.	VLF, Mag	1981	-	T-2445
	42A/6NW	Meunier,D. Prop.	-	Assess.	rTr	1982	-	T-1861
	42A/11SE	Newmont Expl.Can. Ltd.	-	Assess.	DD-2-213 ft.	1982	-	T-2444
	42A/11SE	Placer Development Ltd.	-	Assess.	GL	1981	-	T-1855
	42A/11SW	Pamour Porcupine Mines Ltd.	-	Assess.	VLF	1981	2.3990, 2.4006	T-1954 T-2349
	42A/11SE	Pyke,D.R. Prop.	-	Assess.	OVD-17-236 ft.	1981	-	T-2420, T-2417
Tully Twp.	42A/14SE	Abitibi Price Inc.	-	Assess.	DD-2-1714 ft. OVD-20-1998 ft.	1981	2.3963	T-2344
	42A/14E	Newmont Expl.Can.	-	Assess.	DD-4-2852 ft.	1981	-	T-2404, T-2451
	42A/14SE	Nickel Offsets	-	Not Assess.	Prospectus	1981	-	T-1468
	42A	Norcen Energy Resources Co.Ltd.	-	Assess.	Mag., HEM	1981	2.4028	T-1966, T-2414
	42A/14SE	Romex Resources Ltd	-	Assess.	DD-1-700 ft.	1982	-	T-1915
	42A/10,11	Rosario Resources Canada Ltd.	-	Assess.	OVD-31-5241 ft. DD-4-2455 ft.	1981	-	T-1946
	42A/11E	Texasgulf Can. Ltd.	-	Assess.	Mag, HEM	1981	2.4180	T-2448
	42A/11NE	White Star Copper Mines	Au	Assess.	DD-4-1367 ft.	1981	-	T-2386
Turnbull Twp.	42A/5NE	Tagalder Resources	Au	Assess.	AEM	1980	2.3752	T-2366
Valentine Twp.	42I/5SE	McKinnon, D.Prop.	-	Assess.	Mag	1981	2.3913	T-1445
	42I/N	Selco Inc.	diamonds	Not Assess.	Summary of Exploration	1981	-	T-2408
Walker Twp.	42A/10NE	Montclerg Mines	-	Not Assess.	Prospectus	1980	-	T-248
Walls Twp.	42B/13	Amax Minerals Expl	-	Assess.	AEM, AMag	1981	2.4030	T-1961
Wark Twp.	42A/11NE	Hunkin, P. Prop.	-	Assess.	HEM, Mag	1981	2.3863	T-2434
	42A/11NE	Placer Development Co. Ltd.	-	Assess.	AEM	1981	2.4217	T-2426
West Ridge Lake Area	42J/5,6	Selco Inc.	-	Assess.	Mag. DD-3-385m	1980, 1982	2.4123	T-2450, T-2407
West Sunday Lake Area	32L/4SW	Newmont Exploration	Au	Assess.	DD-10-1234m	1982	-	T-2457
Whitesides Twp.	42A/5NW	Chambers, M. Prop	-	Assess.	Mech. Equipt.	1981	-	T-1794
	42A/5NW	Smith-Morrison Prop	-	Assess.	sTr	1981	-	T-1913
Whitney Twp.	42A/6NE	Meunier,D. Prop.	-	Assess.	DD-1-414 ft.	1981	-	T-1875

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
	42A/11SE	Pyke,D.R. Prop.	-	Assess.	GC	1980	2.4016	T-2436
	42A/11SE	Rio Tinto Expl. Co. Ltd.	-	Assess.	Mag, VLF	1981	2.4040	T-2453
	42A/6NW	Rosario Resources Canada Ltd.	-	Assess.	DD-1-516 ft., GL	1981, 1979	2.4119	T-2401 T-1052
Yeo Twp.	41P/12SW	Bobway Resources Inc.	Au	Assess.	sTr	1981	-	T-2389
	41P/12SW	Canadian Crest Gold Mines Ltd.	Au	Assess.	DD-2-1344 ft.	1981	2.2731	T-1751
	41P/12SW	Johnway Resources Ltd.	Au	Assess.	sTr	1981	-	T-2383
	41P/12SW	Kidd Resources Inc.	Au	Assess.	sTr	1981	-	T-2388
	41P/12SW	Troutfly Resources Inc.	Au	Assess.	sTr	1981	-	T-2387

There continues to be much gold exploration activity in the Detour Lake area. Numerous Vancouver-based junior mining companies have announced preliminary results of geophysical surveys, sampling, and mapping. Often there were recommendations for further work including diamond drilling. The all-weather road scheduled to be completed in the fall of 1983 to the Detour Lake Joint Venture mine site will be a tremendous aid to the exploration effort in the area. Four major companies have been involved in gold exploration in the Detour Lake area. Getty Mines Limited, in a joint venture with Canorex Minerals Limited, completed an extensive drill program. Preliminary results were negligible; however the effort will be resumed in early 1983 (Getty Mines Limited, personal communications, 1982).

Newmont Exploration of Canada Limited drilled 10 holes in the Detour Lake area. Chert-sulphide horizons were intersected, but no significant gold assays were obtained. More drilling is planned (Newmont Exploration of Canada Limited, personal communication, 1982). Westmin Resources Limited has an extensive exploration program in the Detour Lake area. Results from geophysical surveys and overburden drill programs are being followed up by diamond drilling (Westmin Resources Limited, personal communication, 1982).

Dome Exploration (Canada) Limited carried out mapping projects, overburden drilling, and a minor amount of diamond drilling in the Detour Lake area. More drilling is planned for 1983 (Dome Exploration (Canada) Limited, personal communication, 1982).

A large amount of gold exploration activity occurred eastward from Timmins along the Porcupine-Destor Fault. Kidd Creek Mines Limited did 3024 m of diamond drilling in Hoyle Township, 1894 m in Matheson Township, and 1126 m in Cody Township. The company also conducted overburden drill programs for gold exploration in Matheson, Whitney, Ogden, Tully, and Hoyle Townships (Kidd Creek Mines Limited, personal communication, 1982).

Cominco Limited spent $880 000 in the Timmins area in 1982 on gold exploration. This included 2300 m of diamond drilling in Matheson Township and 6500 m (200 holes) of overburden drilling in Matheson, Hoyle, Gowan, and Stock Townships. The company conducted a geophysical program in Dundonald Township (Cominco Limited, personal communication, 1982).

Omenica Resources Limited conducted 3 diamond-drill programs on the former Bingham Property in Whitney Township in 1982. High gold assay results over a large width were reported, but subsequent work did not confirm these results (personal observation of the authors; various articles in the Northern Miner, 1982).

Shiningtree Gold Resources Incorporated drilled 1 hole in Whitney Township, to the west, along strike of the horizon in which Omenica Resources Limited reported the above-mentioned gold intersection.

Westmin Resources Limited conducted an overburden drilling program followed by diamond drilling in Bond Township (Westmin Resources Limited, personal communication, 1982).

Goldeidt, a private company, conducted an overburden drill program followed by diamond drilling in Macklem Township just south of the Asarco Exploration Company of Canada Limited's Aquarius Gold Deposit (Goldeidt and Asarco Exploration of Canada Limited, personal communication, 1982).

Dome Exploration (Canada) Limited, besides being active in the Detour Lake area, had a very ambitious gold exploration program in the Timmins area. Following geochemical and geophysical surveys, the company diamond drilled in Deloro Township. Drill programs northwest of the Detour Lake area south of Kesagami Lake were also conducted to test airborne geophysical targets. A reconnaissance program was initiated in Newton, Dale, and Coppell Townships held under option from Algoma-Talisman. The mine geolo-

gy department did an exploration drilling program on the Davidson-Tisdale Property in Tisdale Township north of South Porcupine (Dome Exploration (Canada) Limited, personal communication, 1982).

Canico Limited (Inco Limited) diamond drilled at least 6 holes on their option just south of Schumacher and east of the former Hollinger Property in Tisdale Township.

Romex Resources Incorporated completed a 4-hole (2500 feet) diamond-drill program in Tully Township (Romex Resources Incorporated, personal communication, 1982).

Hollinger Argus Limited concentrated on a "grass roots" exploration program on their Timmins area properties this year. Claims were staked in Greenlaw, Raney, and Rollo Townships based on the Ontario Geological Survey Input survey data released this spring. Ground geophysics and diamond drilling were completed on properties in Stock and Bond Townships. Programs in both of the above areas are ongoing and will continue in 1983 (Hollinger Argus Limited, personal communication, 1982).

Quinterra, under the direction of W.O. Karvinen and Associates, has started a 3000-foot diamond-drill program (at the time of writing, December 1982) in Tooms and Greenlaw Townships following a program of trenching, overburden drilling, and geophysics (W.O. Karvinen, personal communication, 1982).

In 1982, Nahanni Mines Limited drilled 3 diamond-drill holes in Reaume Township. Trenching and mapping were done in Ogden and Clergue Townships. No significant gold values were obtained (Nahanni Mines Limited, personal communication, 1982).

The most active company in base-metal exploration in 1982 was Kidd Creek Mines Limited. The company drilled 10 546 m for base-metal exploration as compared to 12 200 m in 1981. This year, 17 holes (7075 m) were drilled in Kidd Township, 8 holes (2464 m) in Godfrey Township, 3 holes (631 m) in Jamieson Township, and 1 hole (376 m) in Macdiarmid Township.

Noranda Exploration Company Limited had many programs in progress in this area. Diamond drilling, geophysical surveys, and linecutting were done in Sewell Township. Linecutting and geophysical surveys were also completed in the Sunday Lake area and on a base-metal prospect in Borden Township.

Reconnaissance mapping, ground and airborne geophysics, trenching, X-ray, and overburden drilling formed the exploration program done on properties in McArthur and Fripp Townships. Five claim groups were staked in the the Swayze Belt with ground geophysics being completed as a follow-up to the Ontario Geological Survey Input survey released this spring. Reconnaissance mapping was done in an area stretching from near Gogama to Shiningtree.

Ground geophysical surveys were done in Thomas Township.

Mattagami Lake Exploration had a diamond-drill program in Auden Township northwest of Hearst (Noranda Exploration Company Limited, personal communication, 1982).

Samim Canada Limited drilled and submitted for assessment credit 1800 m of diamond drilling for base-metal exploration in Jamieson, Jessop, and Little Townships (Assessment Files, Ontario Ministry of Natural Resources, Timmins).

Lacana Mining Corporation submitted for assessment credit 217 feet of diamond drilling done in 1982 on the former Triple Lake Porcupine Gold Mines Property in southern McArthur Township.

Placer Development Limited concentrated on the diamond drilling of their properties in Wark and Deloro Townships. Geological mapping and geophysical surveys were done on properties in Cody, Macklem, Ogden, Tisdale, and Whitney Townships. It is of interest to note that a stratigraphic section through the Lower Tisdale Group was completed (Placer Development Corporation, personal communication, 1982).

Amax Exploration Incorporated, in a joint venture program with the Bruneau Mining Corporation, conducted geological and geophysical surveys on properties in Deloro and Ogden Townships. In Ogden Township, 1000 m of diamond drilling were completed. Targets were carbonatized volcanic rocks close to the Destor-Porcupine Fault zone. Amax Exploration Incorporated is also drilling geophysical targets for base-metal exploration in Calvert Township (Amax Exploration Incorporated, personal communication, 1982; Northern Miner, October 28, 1982).

Osway Explorations, a newly formed company has conducted geophysical surveys, geochemical surveys, trenching, and diamond drilling in a gold/base-metal exploration program in Osway and Huffman Townships. The claims are adjacent to the Jerome Mine, a former gold producer, and along the northern contact of a large porphyry mass which is located in the east-central and west-central parts of Osway and Huffman Townships respectively (Osway Explorations, personal communication, 1982).

Granges AB, in an option agreement with Maverick Mountain Resources Limited, conducted an 8-hole diamond-drill program in Osway Township. Electromagnetic anomalies were the drill targets (Granges AB, personal communication, 1982).

Ontario Geological Survey Activities

Under the Precambrian Geology program, G.M. Siragusa mapped Brunswick Township as part of a continuing study of the Swayze Belt. The township adjoins the eastern boundary of the Pensyl Lake area mapped in 1981.

N.F. Trowell, under the Precambrian Section, began a Special Project funded by both the Ontario Ministry of Northern Affairs and the Ontario Ministry of Natural Resources to carry out detailed, synoptic,

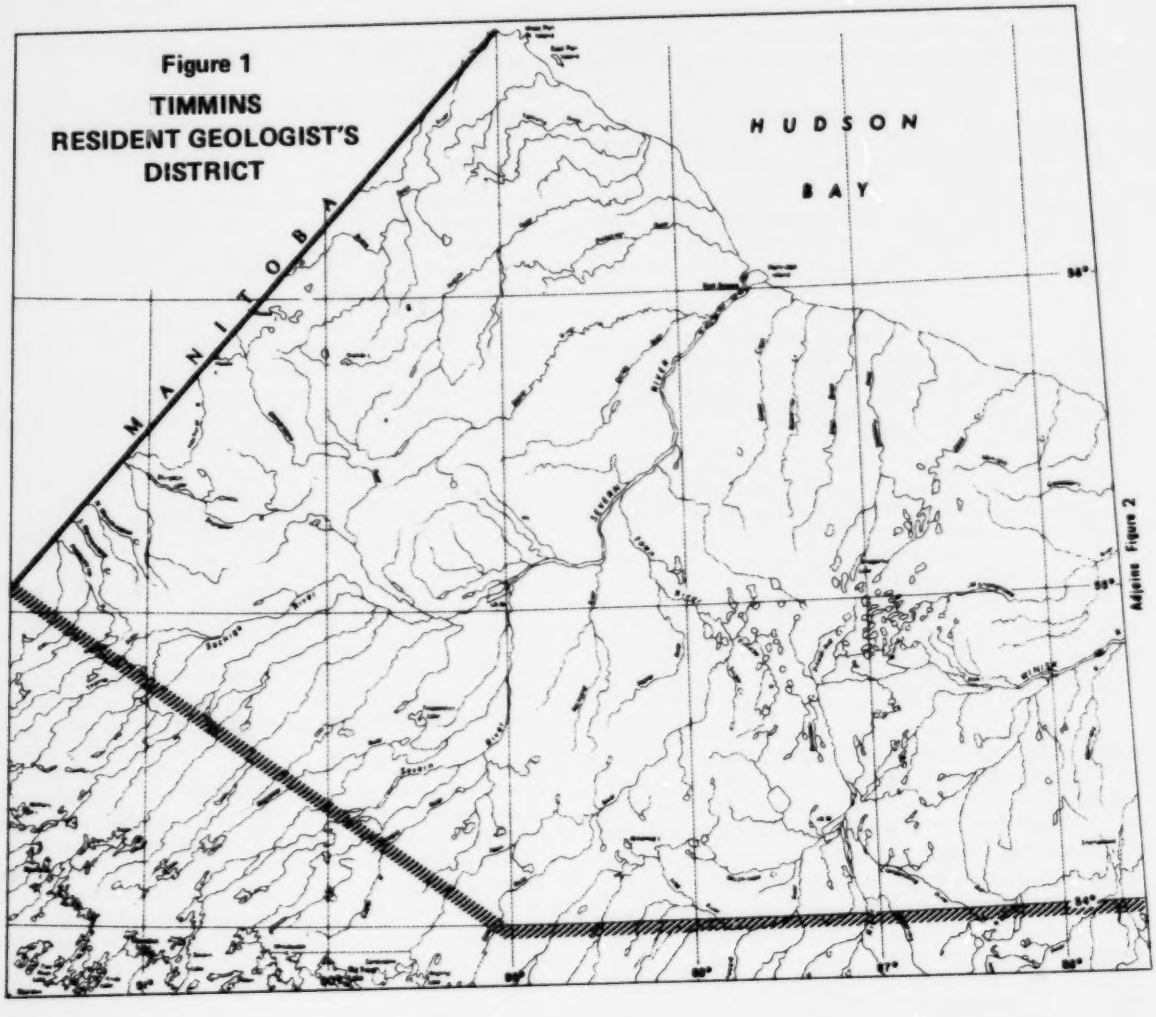


Figure 1
TIMMINS
RESIDENT GEOLOGIST'S
DISTRICT
HUDSON
BAY
MANITOBA
Adjoins Figure 2

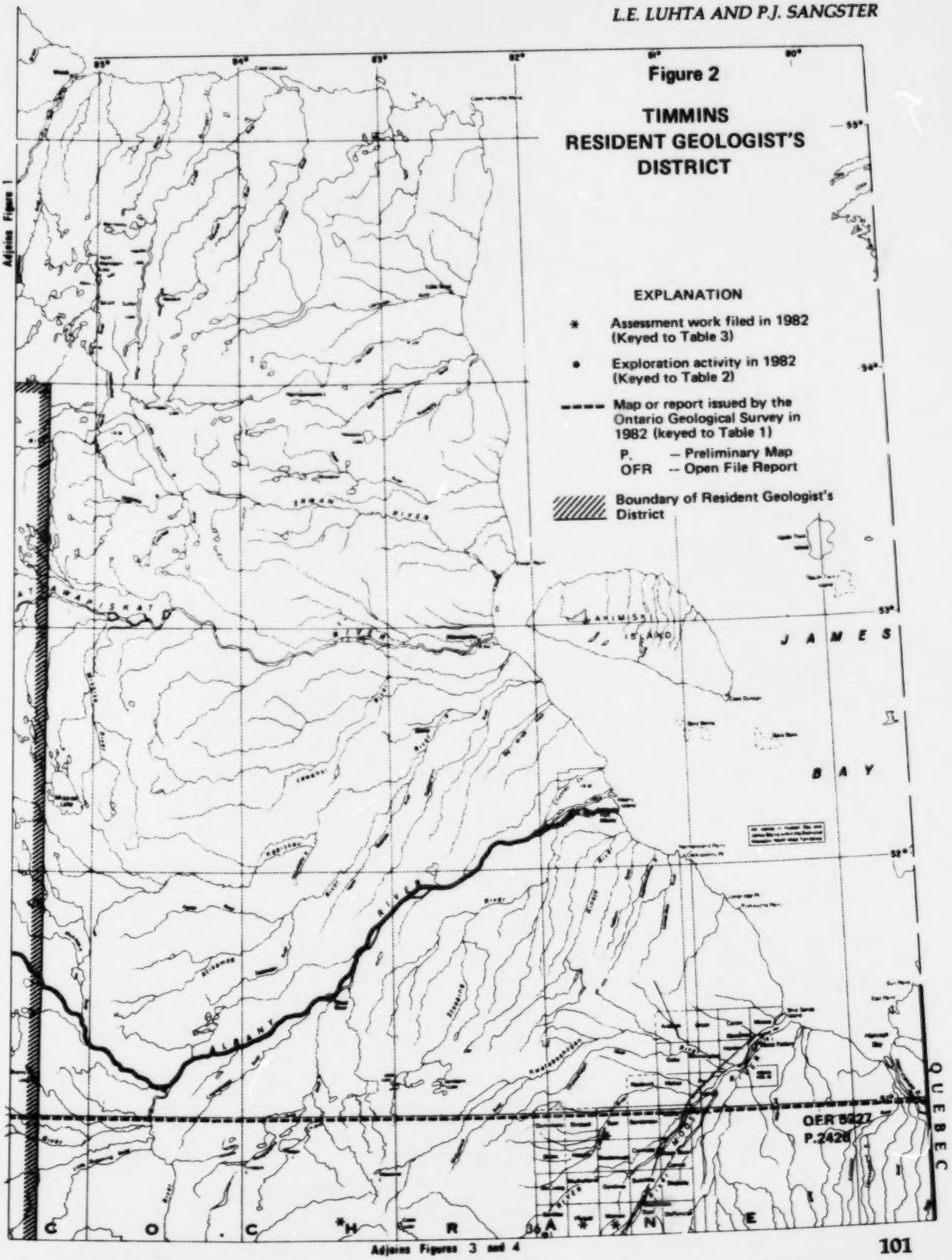


Figure 2
TIMMINS
RESIDENT GEOLOGIST'S
DISTRICT
EXPLANATION
Assessment work filed in 1982
(Keyed to Table 3)
Exploration activity in 1982
(Keyed to Table 2)
Map or report issued by the
Ontario Geological Survey in
1982 (keyed to Table 1)
P. — Preliminary Map
OFR -- Open File Report
Boundary of Resident Geologist's
District
Adjoins Figure 1
Adjoins Figures 3 and 4
JAMES
BAY
ONTARIO
QUEBEC
OFR 5427
P.2426

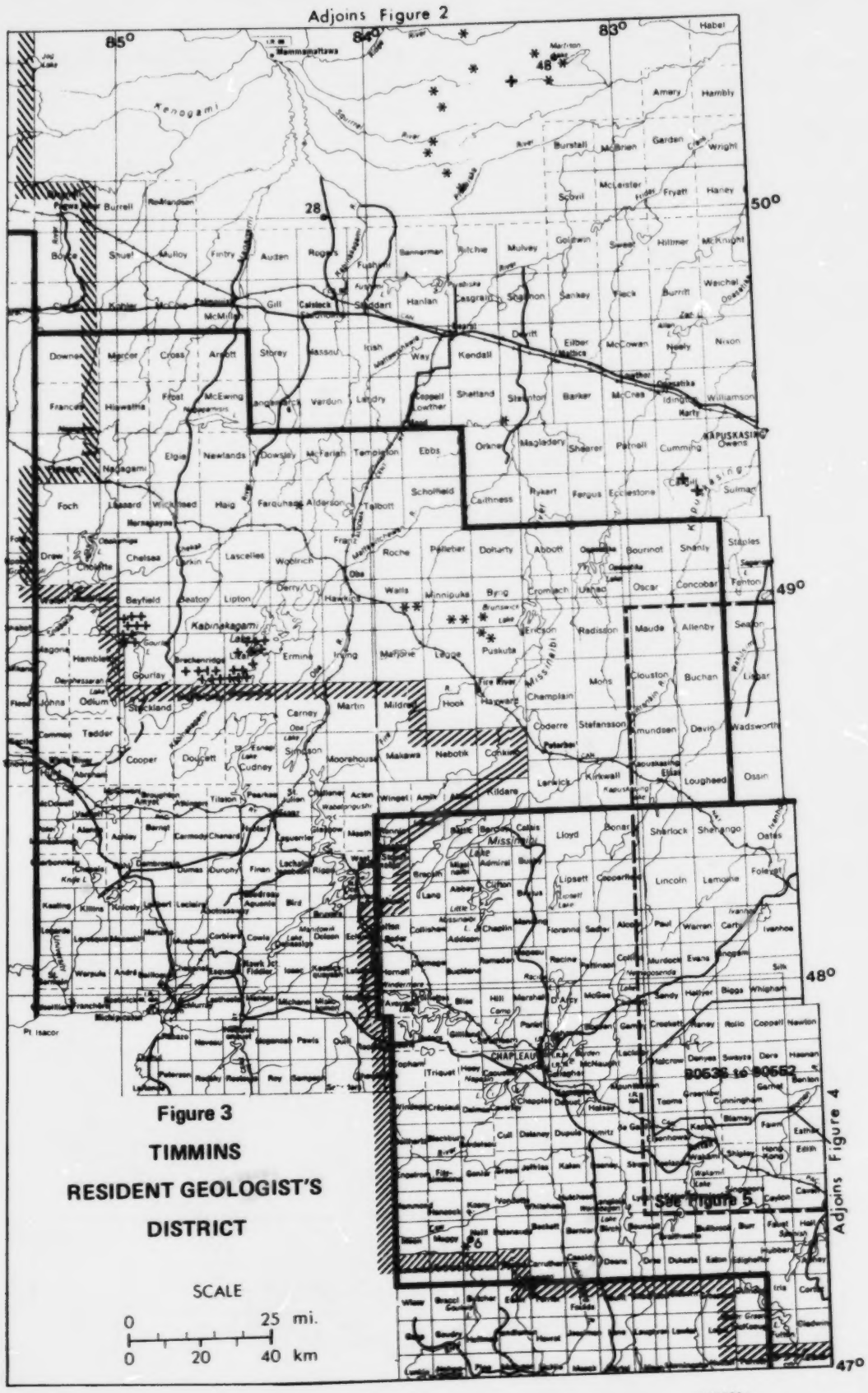


Figure 3

TIMMINS

RESIDENT GEOLOGIST'S

DISTRICT

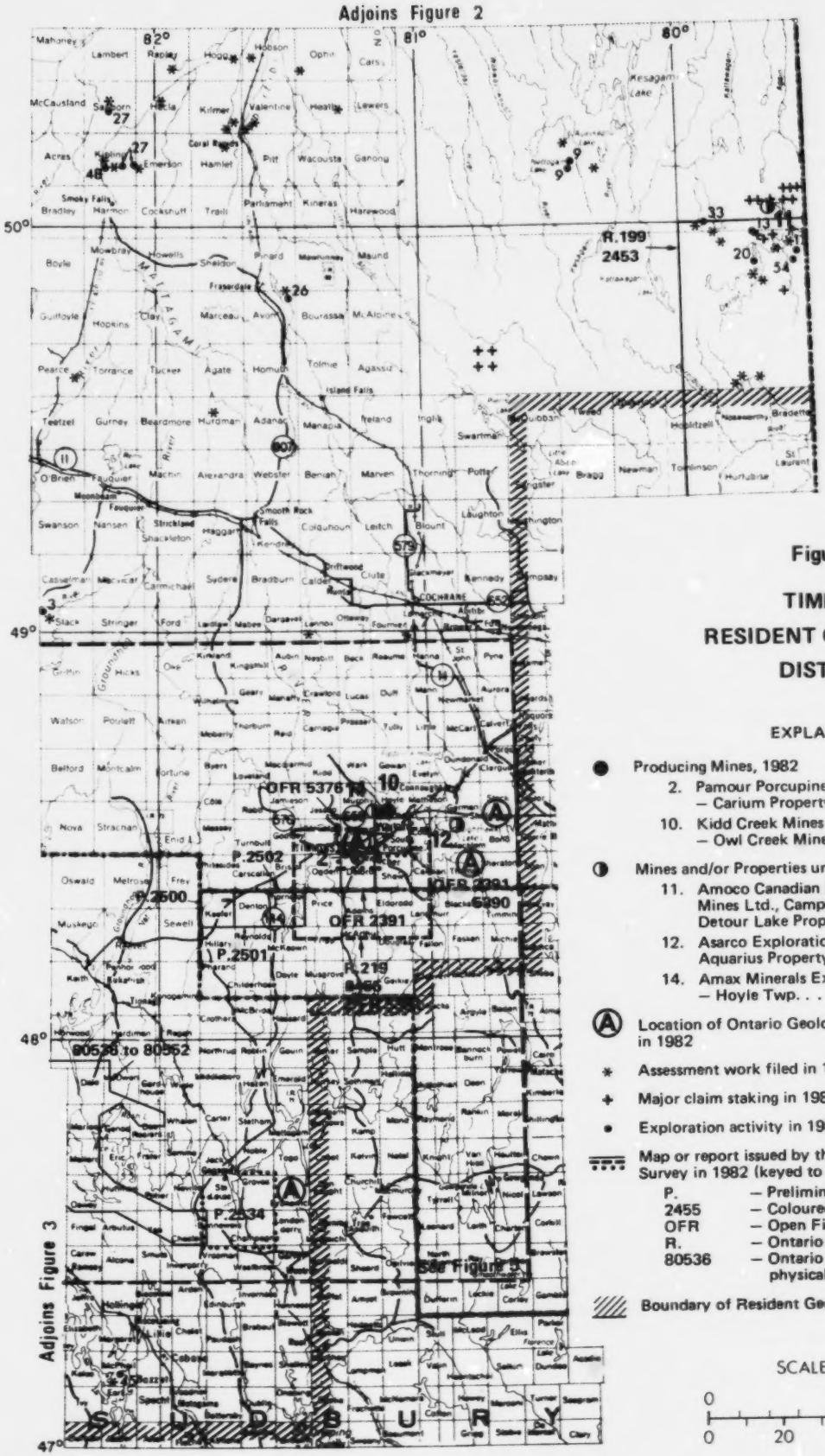


Figure 4

TIMMINS RESIDENT GEOLOGIST'S DISTRICT

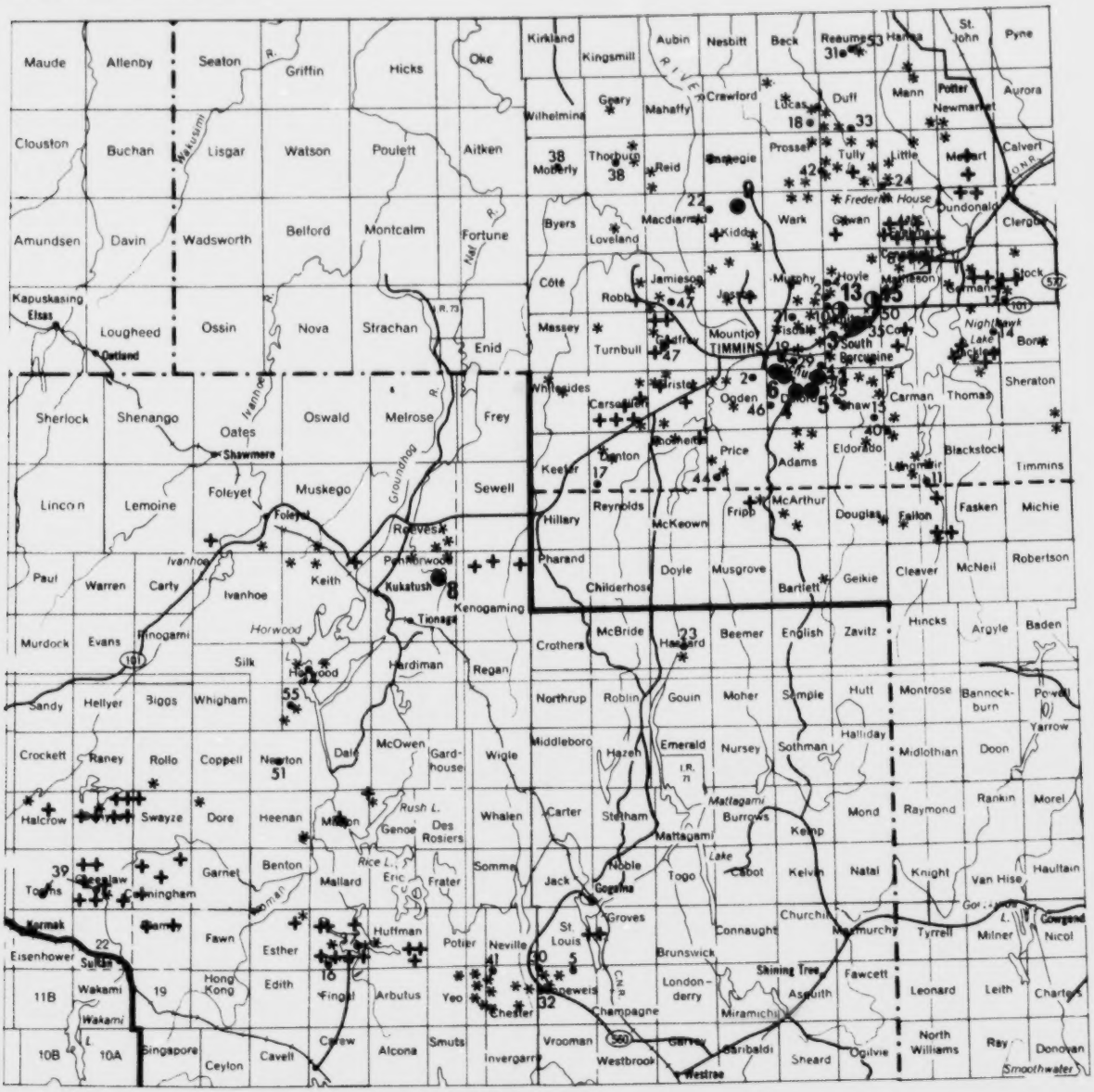
EXPLANATION

- ● Producing Mines, 1982
  - 2. Pamour Porcupine Mines Ltd. — Carium Property . . . . . Au, Cu, Mo
  - 10. Kidd Creek Mines Ltd. — Owl Creek Mine . . . . . Au
- ◑ Mines and/or Properties under Development
  - 11. Amoco Canadian Petroleum Co. Ltd., Dome Mines Ltd., Campbell Red Lake Mines Ltd. — Detour Lake Property . . . . . Au, Cu
  - 12. Asarco Exploration of Canada Co. Ltd. — Aquarius Property, Macklem Twp. . . . . Au
  - 14. Amax Minerals Exploration — Hoyle Twp. . . . . Au
- Ⓐ Location of Ontario Geological Survey Field Party in 1982
- * Assessment work filed in 1982 (keyed to Table 3)
- + Major claim staking in 1982
- • Exploration activity in 1982 (keyed to Table 2)
- Map or report issued by the Ontario Geological Survey in 1982 (keyed to Table 1)
  - P. — Preliminary Map
  - 2455 — Coloured Map
  - OFR — Open File report
  - R. — Ontario Geological Survey Report
  - 80536 — Ontario Geological Survey (Geophysical Survey May 1982)
- ▨ Boundary of Resident Geologist's District

SCALE

0 25 mi.

0 20 40 km


Maude
Allenby
Seaton
Griffin
Hicks
Oke
Kirkland
Kingsmill
Aubin
Nesbitt
Beck
Reaume
Hanna
St. John
Pyne
Clouston
Buchan
Lisgar
Watson
Poulett
Aitken
Wilhelmina
Geary
Mahaffy
Crawford
Lucas
Duff
Mann
Potter
Newmarket
Aurora
Amundsen
Davin
Wadsworth
Belford
Montcalm
Fortune
Byers
Loveland
Macdiarmid
Kidd
Wark
Gowan
Frederick House
Dundonald
Clergue
Calvert
Kapuskasing
Elsas
Lougheed
Ossin
Nova
Strachan
Enid
Côté
Robb
Jamieson
Massey
Turnbull
Godfrey
Mountjoy
TIMMINS
Hoyle
Mathieson
Stock
Night Hawk Lake
Bond
Sherlock
Shenango
Oates
Shawmere
Oswald
Melrose
Frey
Whitesides
Carscallen
Bristol
Ogden
Carman
Thomas
Sheraton
Lincoln
Lemoine
Foleyet
Muskego
Sewell
Keefer
Denton
Price
Adams
Eldorado
Blackstock
Timmins
Hillary
Reynolds
McKeown
Fripp
McArthur
Douglas
Fallon
Fasken
Michie
Paul
Warren
Carty
Ivanhoe
Keith
Penhorwood
Kukatush
Pharand
Childerhose
Doyle
Musgrove
Bartlett
Geikie
Cleaver
McNeil
Robertson
Murdock
Evans
Hinogami
Silk Lake
Hardiman
Regan
Tionaga
Kenogaming
Crothers
McBride
Hazard
Beemer
English
Zavitz
Hincks
Argyle
Baden
Sandy
Hellyer
Biggs
Whigham
Northrup
Roblin
Gouin
Moher
Semple
Hutt
Montrose
Bannockburn
Powell
Yarrow
Crockett
Raney
Rollo
Coppell
Newton
Dale
McOwen
Gardhouse
Wigle
Middleboro
Hazen
Emerald
Nursey
Sothman
Halliday
Midlothian
Doon
Halcrow
Swayze
Dore
Heenan
Milton
Genoe
Des Rosiers
Whalen
Carter
Stetham
Mattagami
Burrows
Kemp
Mond
Raymond
Rankin
Morel
Garnet
Benton
Rice Lake
Eric
Mallard
Frater
Somma
Jack
Noble
Cogena
Togo
Cabot
Kelvin
Natal
Knight
Van Hise
Haultain
Esther
Huffman
Potter
Neville
St. Louis
Groves
Connaught
Churchill
Mowatt
Tyrrell
Milner
Cowgord
Nicol
Eisenhower
Wakami
Hong Kong
Edith
Fingal
Arbutus
Yeo
Chester
Champagne
Brunswick
London-derry
Skining Tree
Asquith
Fawcett
Leonard
Leith
Charters
Wakami Lake
Singapore
Ceylon
Cavell
Crerew
Alcona
Smuts
Invergarry
Vrooman
Westbrook
Garrow
Gribaldi
Sheard
Ogilvie
North Williams
Ray
Donovan
Smoothwater
Ivanhoe
Groundhog
Mattagami
Rice Lake
Lake
Gordon
Kormak
Swamp
Cummingham
Tooms
Chesshaw
Cheminis
Whitney
Pamour
Hoyle Pond
Fredrickhouse
Night Hawk Lake
Lake Tickell
Timmins
Carman
Thomas
Sheraton
Blackstock
Fasken
Michie
Robertson
Argyle
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Childerhose
Doyle
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Bartlett
Geikie
Cleaver
McNeil
Robertson
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Warren
Carty
Ivanhoe
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Penhorwood
Kukatush
Hillary
Reynolds
McKeown
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Kidd
Wark
Gowan
Frederick House
Dundonald
Clergue
Calvert
Clouston
Buchan
Lisgar
Watson
Poulett
Aitken
Wilhelmina
Geary
Mahaffy
Crawford
Lucas
Duff
Mann
Potter
Newmarket
Aurora
Maude
Allenby
Seaton
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Ivanhoe R.
Groundhog R.
Nat R.
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Rice L.
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Nursey
Sothman
Halliday
Midlothian
Doon
Crockett
Raney
Rollo
Coppell
Newton
Dale
McOwen
Gardhouse
Wigle
Northrup
Rob

and stratigraphic mapping along the Destor-Porcupine Fault from east of Timmins to the Quebec border. The map area covered 400 km^2 which included 6 townships. Two of these, Stock and Bond Townships, are in the Timmins Resident Geologist's area.

Richard E. Ernst, also under the Precambrian Section, completed field work this summer on structural and chemical studies of mafic dike swarms in Northern Ontario. Some of the locations covered by the study occurred in the Timmins Resident Geologist's area.

The Engineering and Terrain Geology Section was responsible for 2 Special Projects in the Timmins Resident Geologist's area. J.A. Richard, through funding from the Ontario Ministry of Northern Affairs, completed field mapping and stratigraphic investigations of the Kamiscotia Lake-Pamour area. Investigations of this study area encompassing 2044 km^2 were initiated in 1980. W. Shotyk and P.G. Telford investigated peat deposits in 3 areas of Northern Ontario, as part of the peat component of the Hydrocarbon Energy Resources Program funded under the Board of Industrial Leadership and Development (BILD) Program. Aitken, Hicks, Moberly, Poulett, and Oke Townships northwest of Timmins, and a transect from Timmins north to Moosonee were investigated in the Timmins Resident Geologist's area. Results will be published in an Open File Report.

During the summer of 1982, staff of the Geophysics/Geochemistry Section continued studies on the Nighthawk Test Range in Thomas Township. This testing range program was initiated to test new geophysical equipment by the Section and/or universities, industry, and staff from the Geological Survey of Canada.

C.J. Hodgson working for the Mineral Deposits Section has developed a file containing data in machine managable form, on the geological and economic characteristics, extent of physical exploration, location, discovery date and method, and selected other data on the known gold deposits in the area covered by the Ontario Geological Survey Compilation Map 2205, Timmins-Kirkland Lake area. This should allow exploration geologists to readily determine the nature of the deposit population, either from a geological or an economic point of view.

The industrial minerals programs of the Mineral Deposits Section under the direction of M.A. Vos included studies on the Martison carbonatite-alkalic complex 80 km north-northeast of Hearst. This complex has recently been explored by Shell Canada Resources Limited resulting in the discovery of phosphate and niobium. A quartz sand deposit near Westree will be evaluated for its silica potential under the auspices of the Northern Ontario Rural Development Agreement (NORDA). A sectoral inventory of Industrial Minerals in Northern Ontario, being completed in stages, will facilitate the search for industrial minerals in the area. A feasibility study on the use of boreholes in the mining of silica sand and kaolinite was done in 1982 under a contract with Derry, Michener, Booth, and Wahl. The project is designed to assist in finding economic methods of underground mining of deeply buried silica sand-kaolinite clay deposits in the James Bay Lowland.

Ontario Geoscience Research Grants Program

The Ontario Geoscience Research Grants Program was initiated in 1978 as a means of supporting research at Ontario universities to complement work by the Ontario Geological Survey. Twenty-one projects were approved for funding in 1981-1982. Ten of these were renewal projects. Recipients with studies directly related to the Timmins Resident Geologist's area, listed under the principle applicant are:

J.H. Crocket, McMaster University: Grant 49, Stable Isotope Studies to Gold Metallogeny in the Timmins Camp;

Geoffrey Norris, University of Toronto: Grant 108, Palynostratigraphy of Lignites near Adam Creek and Onakawana, Moose River Basin.

A 1981-1982 recipient with a project referring to the Timmins Resident Geologist's area is:

Ian Nichol, Queen's University: Grant 76, Speciation of Free Gold in Glacial Overburden as a Key to Exploration.

Nineteen final reports on research projects partially or wholly funded under the program in 1981-1982 will be released as Ontario Geological Survey Open File Reports. Published reports related to the Timmins Resident Geologist's area are:

A.J. Naldrett, Open File Report 5380, Grant 17: Platinum Group Elements in Magnetic Sulphide Deposits;

R.E. Whitehead, Open File Report 5376, Grant 30: Gold Exploration Using CO_2, H_2O and Alkali "Anomalies".

Final reports completed and not yet released at this time relating to the Timmins Resident Geologist's area are:

R.W. Hutchinson, Grant 27: Field Relations and Geochemistry of Au, Ni, and Cr Deposits.

R.G. Roberts, Grant 32: Alteration and Gold Vein Environments.

The Ontario Mineral Exploration Program (OMEP)

This program came into effect in 1980 to provide incentives to entrepreneurial individuals and companies not producing minerals in Ontario to invest in mineral exploration in the province. These incentives are in the form of tax credits and grants to cover part of the risk capital. In this area, there were 18 completed exploration programs under OMEP assistance from April 1982 to the end of the year. From these 18 programs, total expenditures were $5.2 million, and eligible expenditures were $4 million. Grants and tax credits amounted to $1 million.

1982 Report of the Kirkland Lake Resident Geologist

Howard Lovell[1], Gary Grabowski[2], and David Guindon[3]

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Introduction

The man-days of assessment work credit assigned in 1982 totaled approximately 300 000, exceeding the number of man days submitted in 1965, the year following the Texasgulf Incorporated discovery of the Kidd Creek Mine near Timmins. This is the highest level of activity in history. Most assessment work credits were submitted for exploration undertaken during the previous year. The decline of claim staking from 1981, about 50% compared to 1982, portends reduced exploration in 1983, unless a gold rush materializes to reverse the figures suddenly (Figure 5). The Bear Island Indian Caution has prevented the recording of mining claims and the raising of funds. Therefore, most exploration has been prevented in the gold-silver mining areas of Matachewan, Gowganda, and Elk Lake for the past 4 years. The Bear Island Indian Caution is presently being judged in the Supreme Court of Ontario.

A proposed shaft, eventually to become the deepest shaft in North America at more than 7200 feet, was collared at the Macassa Gold-Silver Mine in Kirkland Lake in 1982.

Kimberlite boulders were found 1 km west of Larder Lake in the Misema Esker in 1982. This discovery is significant. All previous kimberlite boulders and indicator minerals were discovered in the Munro Esker, an approximately parallel esker 10 km to the west. Both eskers partly follow faults of the Lake Timiskaming Rift Valley, which is a branch of the St. Lawrence Rift System.

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[2]Resource Geologist, Ontario Ministry of Natural Resources, Kirkland Lake.
[2]Geological Assistant, Ontario Ministry of Natural Resources, Kirkland Lake.

SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

TABLE 1

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)	Total Man Days
1982*	2,811	4,419	13,777	81,521	113,111	16,246	246,431
1981	5,498	2,697	15,423	69,906	125,459	19,536	247,087
1980	6,299	1,834	12,622	64,454	115,031	10,981	209,357
1979	4,261	1,452	8,157	29,714	25,352	4,990	68,763
1978	1,710	2,065	5,348	32,602	38,100	8,887	87,144
1977	1,826	2,834	5,703	37,101	45,436	1,820	98,992
1976	2,350	2,979	6,712	47,724	42,338	6,220	102,936
1975	2,916	5,010	7,341	45,880	38,047	6,738	98,624
1974	4,757	2,296	9,435	40,678	55,716	4,441	110,165
1973	3,260	3,214	6,974	34,113	35,811	8,150	92,616
1972	3,253	4,740	6,781	39,371	52,351	3,358	106,026
1971	4,065	3,846	8,268	29,433	48,785	4,764	96,047
1970	4,315	3,704	8,049	25,683	28,683	4,133	73,157
1969	3,404	5,273	7,438	50,892	45,713	15,829	130,185
1968	4,171	7,909	9,307	74,649	82,637	5,799	180,437
1967	5,450	7,341	13,045	79,172	29,073	4,032	143,600
1966	7,606	11,101	14,936	117,544	30,971	8,050	182,352
1965	9,331	6,906	18,431	123,129	88,259	6,530	257,029
1964	12,842	3,884	22,912	77,807	32,644	11,725	149,198
1963	4,710	3,895	13,954	95,696	16,241	4,226	138,627
1962	4,675	4,028	13,139	63,003	5,494	5,099	97,219
1961	3,749	4,451	12,492	47,862	5,494	1,118	79,219
1960	5,024	6,747	13,194	75,123	7,296	4,751	104,632
1959	6,419	5,594	14,917	22,947	3,792	1,404	80,322
1958	8,582	7,108	14,092	37,381	7,481	1,941	66,783
1957	4,664	8,212	12,618	95,934	12,593	3,948	139,891
1956	9,673	3,594	16,166	77,879	20,982	6,693	130,894
1955	4,182	3,999	10,087	75,561	3,389	3,529	105,925

* to Nov. 30

NOTE: 1955 to 1967 includes Larder Lake, Montreal River and Timiskaming Mining Divisions.

TABLE 2 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

GR 199

Open File Reports

OFR 5327 OFR 5384
OFR 5333 OFR 5387
OFR 5371 OFR 5389
OFR 5374 OFR 5390
OFR 5380 OFR 5391

Preliminary Maps - Geological Series

P 2426 P 2433 P 2480
P 2429 P 2434 P 2483
P 2430 P 2477 P 2489
P 2431 P 2478 P 2490
P 2432 P 2479 P 2491
P 2492

Preliminary Maps - Data Series

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

Map 2229
Map 2453

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

MPBP 14
MPBP 15

Miscellaneous Reports

MP 77 MP 101
MP 89 MP 102

Geological Survey of Canada Open File Reports

Resident Geologist Staff Activities

Permanent staff include: Howard Lovell, Resident Geologist; Gary Grabowski, Resource Geologist; and Faye M. St. Jean, Secretary. Additional periods of assistance were provided by Thomas Wright and Bonnie Borden who organized the extensive Mineral Resource Library (about 3000 articles), and by David Guindon and Sally Williams, Geological Assistants. Shawn Price, an Experience '82 student, began to organize for the Larder Lake Mining Division, a diamond-drill core library, and to prepare geological data folios that illustrate all geological and mineral exploration information in the Resident Geologist's office. The office has acquired microfiche for all Ontario Geological Survey (and the former Ontario Department of Mines and Ontario Bureau of Mines) publications, except for maps. These publications are available for reading, or can be printed as hard copy. Publications released by the Ontario Geological Survey can be immediately read and/or copied on the day of release.

The varied activities of the Resident Geologist office included:

1. responding to 2300 inquiries from the exploration and mining industry, government personnel, and the general public
2. preparing about 120 reports on mineral property examinations, diamond-drill core logging, field trips, and technical papers
3. guiding economic geological field trips in the Kirkland-Larder Lakes gold area for 16 groups of mineral explorationists, government, university and foreign geologists, and 2 Ontario Ministry of Natural Resources Junior Ranger camps
4. collecting about 21 000 m (70 000 feet) of diamond-drill core for the core library that in 1982 was contracted to be constructed, and contributing to plans for its design
5. preparation of Geological Data Inventory Folio maps for 7 townships
6. ten land use plans, official municipal plans, timber cutting limits, mining hazard lands, and so on
7. filing for ready retrieval the assessment work representing more that 250 000 man days

Kirkland Lake Resident Geologist Core Library

A contract was issued for a library, with a capacity of 600 000 feet of diamond-drill core, to be built in 1983. Core is to be arranged on racks for retrieval by staff 5 days per week in response to requests to examine core by industry. Kirkland Lake nas stored (although not readily retrievable) approximately 50 000 m (165 000 feet) of whole core plus telescoped samples representing about 25 000 m (83 000 feet) of core. The accompanying map (Figure 1) shows the locations of most of the diamond-drill holes from which the diamond-drill core in storage was derived.

Mining Activity

Because of deteriorating economic conditions, 4 mines that produced in 1981 ceased production in 1982. These are the Hedman Mine which, however, continued to market serpentine filler from its mill, and the gold-silver producers Matachewan Consolidated Mines Limited, Canadian Arrow Mines Limited, and the Garrison Township Murphy Project of Kerr Addison Mines Limited. The 7 producing mines marketed gold and silver, iron pellets, barite, and serpentine filler.

At a ceremony in April 1981, Kerr Addison Mines Limited poured the 10 millionth ounce of gold produced from approximately 36.5 million tons, averaging 0.27 ounce gold per ton. Reserves for 1982 remained approximately the same as for 1981, adequate for about 1½ years production. Also, some custom milling has begun.

In addition to the deep shaft, Willroy Mines Limited, Macassa Division, is planning (depending on a floor price for gold of about $500 C per ounce of gold) to construct a new gold mill to include tower mill grinding, carbon-in-pulp extraction facilities to process 1500 tons per day of Kirkland Lake tailings plus 500 tons per day from the proposed deep shaft.

Property Visits

Casakirk Gold Occurrence (1)

Teck Township

In 1928, Abba Mines Limited sank a 35 m deep shaft on the property. From 1940 to 1943, a crosscut was driven into the southern claim of Casakirk Gold Mines Limited, and drifting was done along a narrow quartz vein cutting mafic syenite and wallrocks bearing pyrite and carbonate. Also, 6 holes were diamond drilled by Macassa Mines Limited and Hollinger Consolidated Gold Mines Limited. Drift samples collected and assayed range up to 0.84 ounce gold per ton, and diamond drilling intersected 0.25 ounce gold per ton across about 1 foot.

Exploration on the surface is warranted. Rock types that contain ore grade concentrations underground extend to the surface.

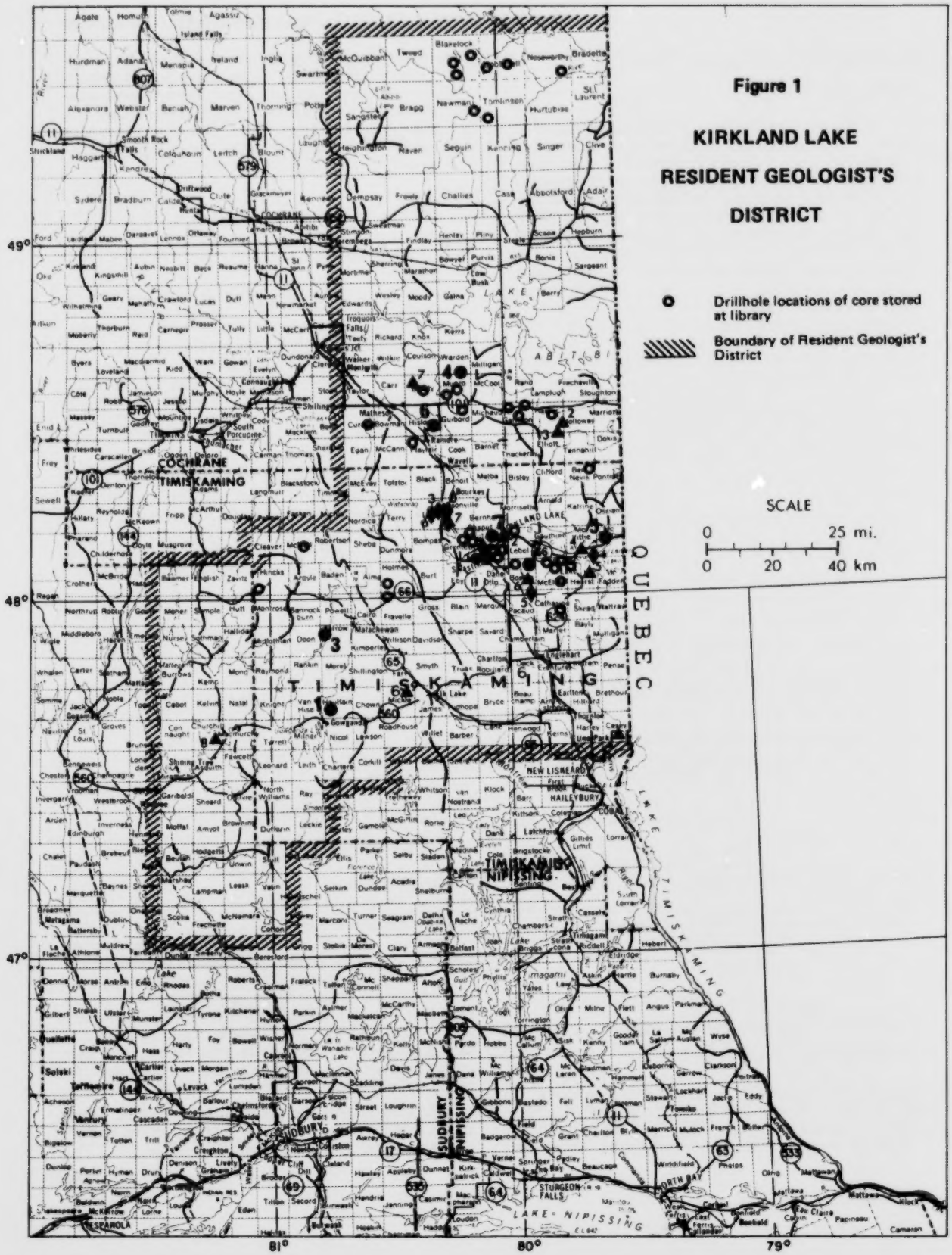
Figure 1
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT
Drillhole locations of core stored at library
Boundary of Resident Geologist's District
SCALE
0 25 mi.
0 20 40 km
COCHRANE
TIMISKAMING
T I M I S K A M I N G
NEW LISKEARD
HAILEYBURY
TIMISKAMING
NIPISSING
SUDBURY
SUDBURY
NIPISSING
STURGEON FALLS
NORTH BAY
LAKE NIPISSING
LAKE TIMISKAMING
QUEBEC
ONTARIO
49°
48°
47°
81°
80°
79°

● Producing Mines

1. Agnico-Eagle Mines Limited
   Castle-Trethewey Mine . . . . . Ag
2. Dominion Foundries and Steel Company Limited
   Cliffs of Canada Limited Adams Mine . . . . . Fe
3. Extender Minerals of Canada Limited . . . . . Barite
4. Hedman Mines Limited. . . . . Serpentine filler
5. Kerr Addison Mines Limited
   Kerr Addison Mine . . . . . Au, Ag
6. Pamour Porcupine Mines Limited
   Ross Mine . . . . . Au, Ag, Cu
7. Willroy Mines Limited
   Macassa Mine . . . . . Au, Ag

▲ Properties Under Major Evaluation

1. Agnico-Eagle Mines Limited Langis Mine . . . . . Ag,Co
2. Amax Minerals Exploration
   Harker-Holloway Tps. . . . . Au
3. Golden Harker Explorations Limited. . . . . Au
4. Lenora Exploration Limited. . . . . Au
5. Longlac Mineral Exploration Limited
   Martin-Bird Mine . . . . . Au
6. Marshall Minerals Corporation. . . . . Au
7. Maude Lake Gold Mines Limited . . . . . Au
8. Shiningtree Gold Resources Incorporated . . . . . Au
9. Silver Lake Resources Incorporated . . . . . Ag

♦ Property Visits

1. Casakirk
   (Spark Gold Mines Limited) . . . . . Gold Occurrence
2. Fidelity
   (Haas-Warner Mining Limited). . . . . Gold Occurrence
3. Lee Gold . . . . . Gold Occurrence
4. Lenora Exploration Limited "Lake" . . . . . Gold Occurrence
5. Planet Gold . . . . . Gold Occurrence
6. D. Scales . . . . . Gold Occurrence
7. Sullivan. . . . . Gold Occurrence
8. Trapper. . . . . Gold Occurrence

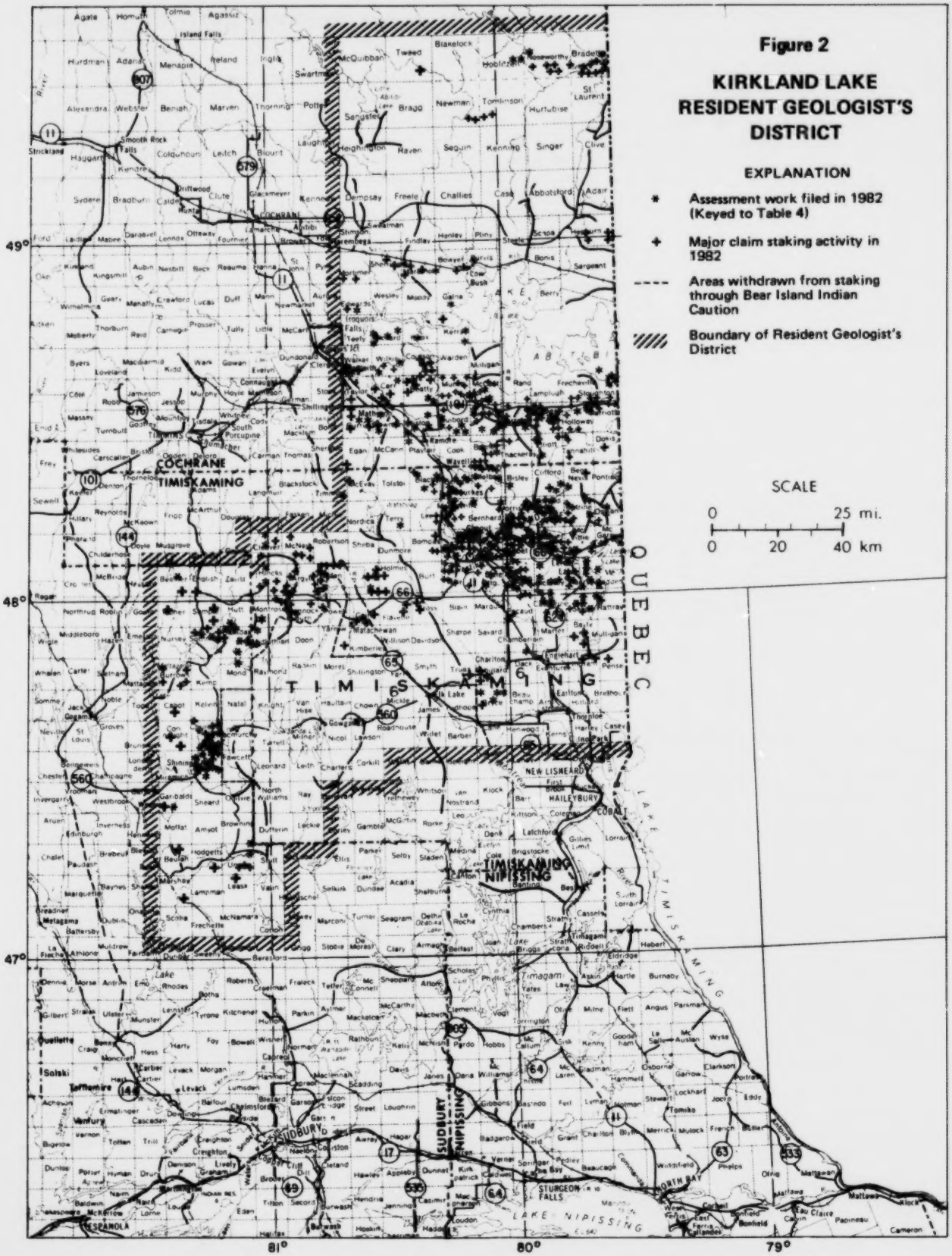
Figure 2
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT
EXPLANATION
Assessment work filed in 1982 (Keyed to Table 4)
Major claim staking activity in 1982
Areas withdrawn from staking through Bear Island Indian Caution
Boundary of Resident Geologist's District
SCALE
0 25 mi.
0 20 40 km
QUEBEC
COCHRANE
TIMISKAMING
NIPISSING
SUDBURY
49°
48°
47°
81°
80°
79°

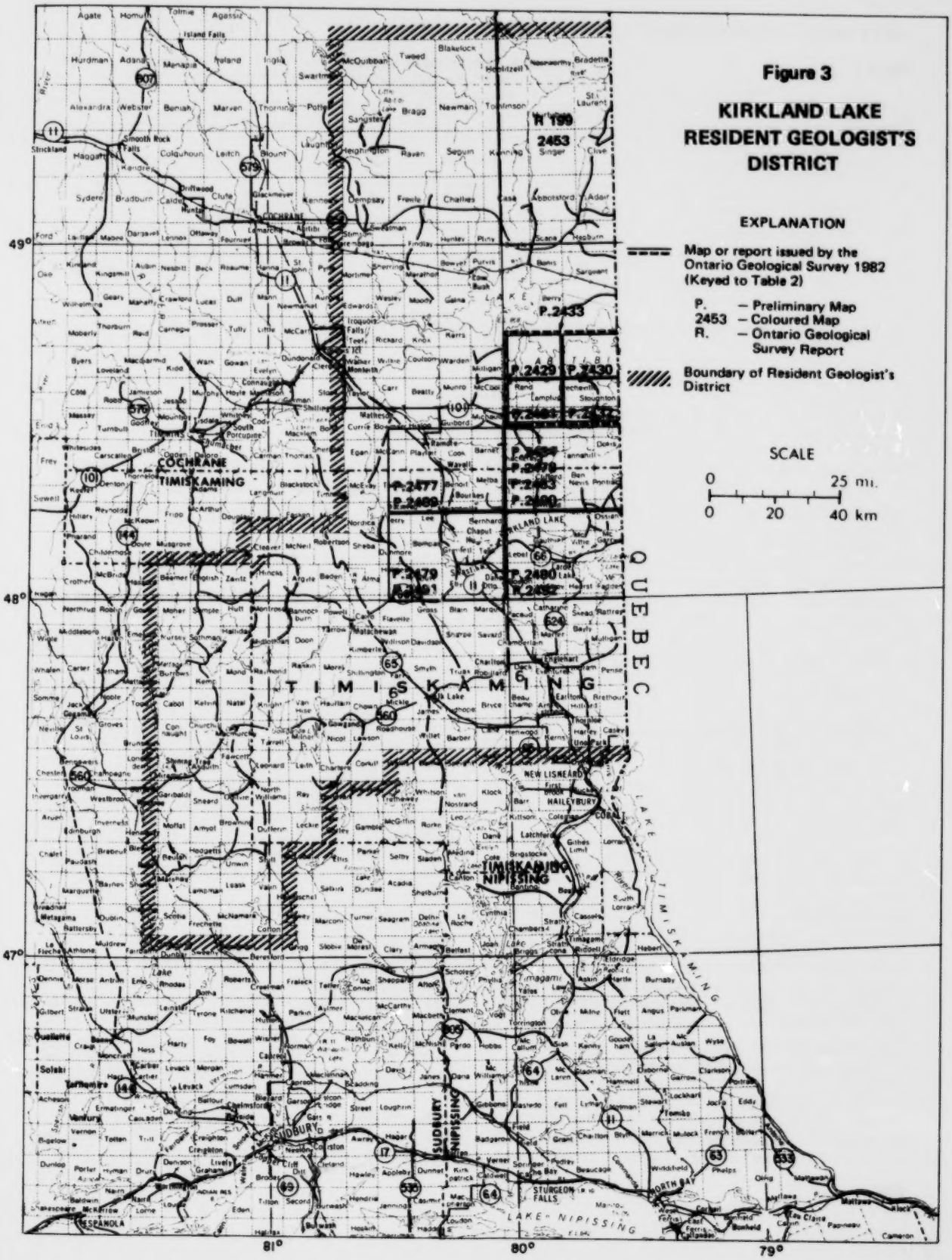
Figure 3
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT
EXPLANATION
Map or report issued by the Ontario Geological Survey 1982 (Keyed to Table 2)
P. – Preliminary Map
2453 – Coloured Map
R. – Ontario Geological Survey Report
Boundary of Resident Geologist's District
SCALE
0 25 mi.
0 20 40 km
R 199
2453
P.2433
P.2429
P.2430
P.2477
P.2479
P.2480
COCHRANE
TIMISKAMING
KIRKLAND LAKE
TIMISKAMING
NEW LISKEARD
HAILEYBURY
TIMISKAMING
NIPISSING
SUDBURY
NIPISSING
STURGEON FALLS
QUEBEC
LAKE TIMISKAMING
LAKE NIPISSING
49°
48°
47°
81°
80°
79°

TABLE 3

AIRBORNE GEOPHYSICAL SURVEY

(on file at the Kirkland Lake Resident Geologist office)
(keyed to Figure 4)

No.	Client	Contractor	Type	Year	Tp. or Area
1	Canadian Javelin Ltd	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1965	Abbotsford, Adair, Hepburn
2	Amax Exploration Inc.	Seigel Associates Ltd.	Mag, EM	1971	Ben Nevis, Pontiac, Katrine
3	Cominco Ltd.	Scintrex Ltd.	EM	1971	Ben Nevis
4	Knox, W.	Aerophysics of Canada Ltd.	EM	1957	Boston, McElroy
5	Raylloyd Mines & Explor. Ltd.	Barringer Research	EM	1968	Bryce, Tudhope
6	Moncrieff Uranium Mines Ltd.	Questor Surveys Ltd.	EM	1970	Catharine
7	Bardyke Mines Ltd.	Lundberg Exploration Ltd.	Mag.	1956	Connaught
8	Union Carbide Canada Mining Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Coulson, Milligan, McCool, Warden, Rand
9	Canadian Javelin Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, Em	1964	Edwards, Mortimer
10	Glen Lake Silver Mines Ltd.	Hunting Survey Corporation	Mag, EM	1962	Mortimer, Edwards, Sherring, Wesley, etc.
11	Patino Mining Corporation, The	Questor Surveys Ltd.	EM	1971	Frecheville, Lamplugh, Stoughton, Marriot
12	North American Rare Metals Ltd.	Hunting Survey Corporation	Mag, EM	1962	Galna, Marathon, Moody, Etc.
13	Upper Canada Mines Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Gauthier, McVittie
14	Consolidated Ranwick Uranium Mines Ltd.	Aeromagnetic Surveys Ltd.	Mag, Rad	1954	Guibord, Munro, Michaud
15	Corridor Mines Ltd.	Spartan Aero Ltd.	Mag, EM	1971	James, Tudhope, Truax.
16	Timiskaming Nickel Ltd.	*Huntec (Lockwood Survey)	Mag, EM	1968	Kelvin
17	Timiskaming Nickel Ltd.	Huntec (Lockwood Survey)	Mag, EM	1968	Knight, Natal, Tyrrell, Macmurchy
18	Biltaurum Mines Ltd.	Lundberg Exploration Ltd.	EM	1952	Knox, Rickard
19	Boland-Bell	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1965	Melba
20	Laroma Midlothian Mines Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1963	Midlothian
21	Stairs Exploration	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1963	Midlothian
22	H.H. Wright Syndicate	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Milligan
23	Kennco Explorations (Canada) Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Munro, Milligan, Warden, Kerrs, McCool
24	Canadian Johns Manville Co. Ltd.	Hunting Survey Corporation	Mag.	1964	Skead, McElroy
25	Denison Mines Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1965	McNeil, Robertson
26	Keevil Mining Group Ltd.	Canadian Aero Mineral Surveys Ltd.	EM	1964	Rand
27	Sutherland, W.D.	Huntec (Lockwood Survey)	Mag, EM	1968	Van Hise
28	Taylor Gold Mines Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Taylor
29	Geoscientific Prospectors	Mining Geophysics Ltd.	Mag,		Powell, Cairo, etc.
30	Satellite Metal Mines Ltd.	M.J. Boylen Eng. Associates	Mag, Rad	1968	Gauthier
31	Hudson Bay Expl. & Dev. Co. Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Macmurchy, Kelvin, Natal, Churchill
32	Collins, R., Collins, Y., Marino, L., McKinnon, D., Todd, B.	Geoterrex Ltd.	Mag, EM	1971	Connaught, Brunswick
33	Texo Extension Mines Ltd.	Canadian Aero Mineral Surveys Ltd.	Mag, EM	1964	Taylor, Walker, Clergue, Stock
34	Timiskaming Nickel Limited	Huntec (Lockwood Survey)	Mag, EM	1968	Midlothian
35	Caradian Johns Manville Co. Ltd.	Survair Ltd.	Mag.	1969	Midlothian
36	Cominco Limited	Questor Surveys Ltd.	Mag.	1975	Edwards, Knox, Moody, Rickard,Teffy, Wesley
37	Dome Exploration (Canada) Ltd.	Xenting Earth Sciences Ltd.	Mag.	1975	Abbottsford, Case, Newman, Singer, Tomlinson
38	Superior Northwest Inc.	Dighem Limited	Mag, EM	1976	Hearst, McElroy, McFadden, Skead
39	Metron Exploration Ltd.	Dighem Limited	EM	1976	Hodgetts
40	Granges Exploration Canada A.B.	Questor Surveys Ltd.	Mag, EM	1973	English, Beemer, Zavitz, Bartlett, Hincks, Semple, Hutt
41	Granges Exploration Canada A.B.	Questor Surveys Ltd.	EM	1975	Sothman
42	New Insco Mines Ltd.	Dighem Limited	Mag, EM	1974	Bisley, Clifford, Elliot, Tannahill, Dokis
43	Tagliamonte, F & Fedora, J.A.	Dighem Limited	Mag, EM	1973	Guibord, Cook
44	Here Fault Copper Limited	Dighem Limited	Mag, EM	1973	Melba
45	Ministry of Natural Resources	Questor Surveys Ltd.	Mag, EM	1974	Cleaver, McNeil, Robertson, Hincks, Argyle, Baden, Powell, Bannockburn, Montrose
46	Ontario Ministry of Natural Resources, Department of Energy & Mines	Resource Geophysics & Geochemistry Division, Geological Survey of Canada	Mag	1975	Kirkland Lake - Abitibi Lake area
47	Geophysical Eng. Ltd.	Dighem	EM	1975	Hearst, McFadden, McVittie, McGarry
48	Amax Minerals Exploration Project 839	Questor Surveys Ltd.	Mag, EM	1979	Coulson, Guibord, Garrison McCool, Warden, Beatty, Munro
49	Rio Tinto Canadian Exploration Ltd.	Aerodat Ltd.	Mag.	1979	Marshay, Scotia
50	Hollinger Mines Ltd.	Questor Surveys Ltd.	EM	1978	Wilkie
51	Amax Minerals Exploration	Aerodat Ltd.	Mag.	1980	Cabot
52	Rio Tinto Canadian Exploration Ltd.	Questor Surveys Ltd.	Mag.	1979	Lake Abitibi area
53	Canadian Gold and Metals Inc.	Geophysical Surveys Inc.	Mag, EM	1981	Barnet

TABLE 3 Continued

No.	Client	Contractor	Type	Year	Tp. or Area
54	Meteor Resources Inc.	Geophysical Surveys Inc.	Mag, EM	1980	Beulah, Moffat
55	Rosario Resources Canada Ltd.	Aerodat Ltd.	Mag, EM	1980	Bisley, Melba, Thackeray
56	Amax Minerals Exploration	Aerodat Ltd.	Mag, EM	1979	Beatty, Harker, Holloway, McCool, Munro. Warden
57	Norcen Energy Resources Ltd.	Scintrex Ltd.	Mag, EM	1981	Halliday, Hutt, Midlothian, Mond, Raymond, Sothman
58	Hudbay Mining Ltd.	Questor Surveys Ltd.	EM	1980	Hoblitzell, Noseworthy
59	Placer Development Ltd.	Placer Development Ltd.	Rad	1980	McFadden
60	Kennco Exploration (Canada) Ltd.	Geophysical Surveys Inc.	Mag, EM	1981	McGarry
61	Regal Goldfields Ltd.	Questor Surveys Ltd.	Mag, EM	1981	Halliday, Midlothian
62	Noranda Exploration Company Limited	Questor Surveys Ltd.	Mag, EM	1981	Bowyer, Marathon
63	Ontario Ministry of Natural Resources	Questor Surveys Ltd.	Mag, EM	1979	KLIP area
64	Ontario Ministry of Natural Resources	Terra Surveys Ltd, Kenting Earth Sciences Ltd, Northway Survey Corporation Ltd.	Rad	1976	31M, 41P, 32D, 42A
65	Ontario Department of Mines & Northern Affairs	Barringer Research Ltd.	Mag, EM	1970	Beatty, Coulson, Guibord Hislop, Munro, Warden

Fidelity Gold Occurrence (2)

Teck Township

Lithology and mineralization on this property resembles somewhat that of the currently active Hemlo area east of Marathon. From 1918 until 1920, Fidelity Mining and Development Company Limited sank a decline shaft to 300 feet, and did 747 feet of lateral development on the 140-foot and the 300-foot levels. In 1975, Haas-Warner Mining Limited built a branch road from the Kirkland Lake airport road to the property, stripped overburden, and did some rock work. Country rocks are diorite and "greenstone" cut by quartz porphyry. At the portal of the decline shaft, a quartz vein was 20 inches wide and at the 140-foot level the mineralized zone was 7 feet wide (Burrows and Hopkins 1920).

The main host rock for gold mineralization is rusty grey quartz-feldspar-sericite volcaniclastic metasediment that, in places, is cemented by carbonate, and contains sparse fuchsite (chrome muscovite). Where present in significant concentrations, gold is associated with pyrite and molybdenite, and ranges from 0.02 to 0.7 ounce gold per ton (H.A. Lee, Consultant, Stittsville, personal communication, 1974). Higher grades occur where native (visible) gold is present.

Lee Gold Occurrence (3)

Lee Township

The decline shaft on the property extends for 125 feet; lateral work includes 250 feet of drifting mostly southeastward, but also a short distance to the northwest. The decline shaft is in an area underlain by Kinojevis Group tholeiitic basalt, pillow-topped flows that have been fractured and sheared principally in the northwest-southeast direction. The flows strike southwest and the tops are to the southeast.

White quartz-carbonate veins and pillow interstices contain a little pink dolomite, pyrite cubes and lenses, greenish black chloritic inclusions and vein walls, and yellowish green epidote. Gold content of grab samples ranges from *nil* to about 0.75 ounce gold per ton, and visible gold remains in the face underground (Ches Shea, Prospector, Sesekinika, personal communication, 1982).

Northwest of the decline shaft, gold mineralization extends a short distance into the overlying Cobalt Group sedimentary rocks. The Lee Gold Number 2 shaft was collared in gold-bearing Cobalt Group sedimentary rocks less than 3 feet above the basalt basement rocks (Ches Shea, Prospector, Sesekinika, personal communication, 1982).

Lenora Exploration Limited "Lake" Gold Occurrence (4)

McVittie Township

The Ontario Department of Mines, Map 50b (Thomson 1941) identifies the country rocks of this mining claim as being mostly syenite and quartz syenite. Early prospecting was applied to quartz veins that contain rare visible gold, and cut a green carbonate rock containing trace to 0.02 ounce gold per ton. Largely overlooked by the early prospectors was the less distinctive brownish grey-coloured carbonate rock, which is typically cut by less frequent quartz-carbonate veins. Recent stripping and pressure hosing around the known gold-bearing zone has exposed more green and brownish grey-coloured carbonate rocks. Most of the green-coloured carbonate rock is conglomerate containing green and brownish grey-coloured carbonate pebbles, most of which are subangular to rounded; some are slightly deformed. The environment of deposition of the conglomerate may have been a tidal flat.

The major minerals in the green carbonate rock are; chrome muscovite ("fuchsite" or "mariposite"), sericite, dolomite, and the accessory minerals pyrite and arsenopyrite. Calcareous mudstone is interbedded with, overlies, and is slump folded into beds of green carbonate conglomerate. This mudstone is composed of brownish grey-coloured recrystallized

TABLE 4 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

Abbreviations

A - Airborne Survey
AEM - Airborne Electromagnetic Survey
A Mag - Airborne Magnetometer Survey
Assess - Assessment Work
CS - Core Samples
D - Donated by Company or Individual
DD - Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled respectively).
EM - Electromagnetic Survey
GL - Geological Survey
HLEM - Horizontal Loop Electromagnetic Survey
IP - Induced Polarization Survey
Mag - Magnetometer Survey
OVD - Overburden Drilling (the numbers following "OVD" indicate the number of holes drilled and the total length respectively).
OSC - Ontario Securities Commission
Pros - Prospectus
Rad - Radiometric Survey
SA - Sampling, Assays
TTr - Rock Trenching
VEM - Vertical Loop Electromagnetic Survey
VLF - Very Low Frequency

Mineral and Metal Symbols

Au - Gold
Ag - Silver
Cu - Copper
Mo - Molybdenum
Co - Cobalt
BM - Base Metals

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Alma	42-A-2	Northclaim Resources Incorp.	Au	Assess	CS, DD (2) 307'	1981		
Arnold	32-D-5	Lacana Mining Corporation	BM, Au	Assess	Mag, VLF-EM	1980	2.4102	
Argyle & Hincks	42-A-2	Johns-Manville Canada Incorp. "McGill Group"	Au	Assess	Mag, VEM	1981	2.4412	
Asquith	41-P-11	Patino Mines (Quebec) Ltd. "Annett Option"	Au	Assess	GL	1981	2.4362	
Asquith	41-P-11	Patino Mines (Quebec) Ltd. "Joe Sauve Group"	Au	Assess	GL	1981	2.4313	
Asquith	41-P-11	Patino Mines (Quebec) Ltd. "Nora Lake Prop."	Au	Assess	GL	1981	2.4501	
Asquith & Churchill	41-P-11	Patino Mines (Quebec) Ltd. "Shining Tree 1 Property"	Au	Assess	VLF-EM	1981	2.3972	
Asquith	41-P-11	Patino Mines (Quebec) Ltd. "West Shining Tree Group"	Au	Assess	GL	1981	2.4364	
Asquith	41-P-11	Sauve, J.	Au	Assess	Mag	1981	2.4349	
Asquith	41-P-11	Timmins Gold Resources Ltd. "Gibson Property"	Au	Assess	DD (4) 417'	1981		
Asquith	41-P-11	Timmins Gold Resources Ltd. "Shining Tree 1 Property"	Au	Assess	DD (3) 374'	1981		
Baden	42-A-2	Manitou Lake Gold	Au	OSC	Pros	1979	63.3893	
Bannockburn & Montrose	41-P-15 42-A-2	Patino Mines (Quebec) Ltd.	Au	Assess	GL	1981	2.4367	
Bannockburn	41-P-15	Petromet Resources Limited "Ashley Property"	Au	Assess	GL	1981	2.4395	
Barnet	42-A-8	Canadian Gold & Metals Incorp.	Au	Assess	OVD (27) 1164'	1982	2.4583	
Barnet	42-A-8	Noranda Exploration Company Limited "1-79"	Au, BM	Assess	DD (1) 444'	1980		
Beatty	42-A-9	Amax Minerals Exploration "Beatty-6"	Au, BM	Assess	GL	1981	2.4207	
Beatty	42-A-9	Ward, J.T.	Au, BM	Assess	Mag	1981	2.4393	
Beamer	42-A-3	Lynco Resources Incorporated	Au	Assess	Mag, VLF-EM, Rad,GL	1981	2.4068	
Benoit	42-A-8	Goliath Mines Ltd.	Au	Assess	DD (3) 2118'	1981		
Benoit & Melba	42-A-8	Silver Pack Resources Ltd.	Au	Assess	Pros	1981	68.3873	
Bernhardt & Maisonville	42-A-1 42-A-8	Cedar Ridge Explorations Ltd.	Au	OSC Assess	Pros, VLF-EM	1981 1981	63.3874 2.4073	
Bisley & Melba	32-D-5 42-A-8	Falconbridge Copper Corporation "Rosario Option"	BM, Au	Assess	GL	1981	2.4355	
Black	42-A-8	Gray, M.		Assess	DD (2) 204'	1981		
Black	42-A-8	Onaping Resources Ltd.		Assess	HEM	1981	2.3810	
Black	42-A-8	Teck Explorations Limited		Assess	GL, Mag	1980	2.3693	
Bonis, Hepburn Scapa & Steele	32-D-13	Asarco Exploration Company of Canada Limited "Departure Creek Project"	BM, Au	Assess	OV D (35) 1877'	1982	2.4496	

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Boston	32-D-4	Planet Gold Mines Limited	Au	D	Information Circular	1937		
Bowman & Currie	42-A-7,8	Asarco Exploration Company of Canada Limited "Cook Project"	Au, BM	Assess	OVD (11) 1 515' DD (3) 1471'	1981	2.4476	
Bowman & Hislop	42-A-8	Asarco Exploration Company of Canada Limited "Vimy Ridge Proj."	Au, BM	Assess	OVD (19) 1 699'	1981	2.4475	
Bowyer & Marathon	42-A-16	Noranda Exploration Company Limited	BM, Au	Assess	AM, AEM	1982	2.5034	
Bradette	32-E-12	Noranda Exploration Company Limited "1-80"	Au, BM	Assess Assess	Mag, HEM DD (2) 1 181'	1981 1981	2.4018	
Bradette	32-E-12	Noranda Exploration Company Limited "2-80"	Au, BM	Assess	HEM, Mag	1981	2.3817	
Browning, Stull & Unwin	41-P-6	Patino Mines (Quebec) Limited "Unwin Property"		Assess	GL	1981	2.4443	
Bryce	41-P-9	Anaconda Canada Exploration Ltd. "Britcana Property"	Au	Assess Assess	DD (27) 3 586' GL	1981 1981	2.4542 2.4428	
Bryce	41-P-9	Petromet Resources Limited	Au	Assess	GL	1981	2.4325	
Bryce	41-P-9	Yvanex Developments Limited,-Nindjammer Power & Gas Limited "Briscoe-Bryce Property"	Au	Assess	Mag, VLF-EM	1981	2.4151	
Cairo	41-P-15	Minorex Limited "Hanson-Welsh Option"	Au	Assess	DD (1) 515'	1981		
Cairo	41-P-15	Pamour Porcupine Mines Limited	Au	Assess	GL	1981	2.4025	
Carr	42-A-9	Asarco Exploration Company of Canada Limited	Au	Assess	OVD (5) 540.5'	1981	2.4474	
Carr	42-A-9	Pyke, D.R.	Au	Assess	OVD (39) 1 330'	1981	2.4203	
Catharine	31-M-13	Dome Exploration (Canada) Limited	Au	Assess	Mag	1980	2.3988	
Catharine	31-M-13	Kerr Addison Mines Limited	Au	Assess	DD (3) 1 437'	1981		
Churchill	41-P-11	Patino Mines (Quebec) Limited "Gosselin North Property"	Au	Assess Assess	Mag, VLF-EM GL	1981 1981	2.4027 2.4398	
Churchill	41-P-11	Patino Mines (Quebec) Limited "Shiningtree 1 Property"			See under Asquith Tp.			
Churchill	41-P-11	Timmins Gold Resources Limited	Au	Assess	DD (2) 612'	1982		
Cleaver	42-A-3	Teck Explorations Limited	Au	Assess	Mag	1980	2.3693	
Clifford	32-D-5	Croxall, J.& Allsopp, A	Cu, Zn	Assess	rTr,SA	1980	2.3807	
Currie	42-A-7,8	Asarco Exploration Company of Canada Limited "Cook Project"			See under Bowman Tp.			
Dack	31-M-13	Mowat, A.	Au	Assess	Rad, GL	1981	2.4284	
Eby	42-A-1	Jomi Minerals & Expediting Limited "Group A"	Au	Assess	Mag, VLF-EM	1981	2.4219	
Edwards	42-A-15	Amax Minerals Exploration "Edwards-2"	BM, Au	Assess	DD (1) 344'	1982		
Elliott	32-D-5	Falconbridge Nickel Mines Limited	Au, BM	Assess	VLF-EM, Mag	1981	2.3778	
Galna	42-A-16	Pelangio Larder "Campthree Bay Project"	Au, BM	Assess	Mag, VLF-EM	1981	2.4108	
Garibaldi	41-P-6	Vermillion Placers Incorporated	Au	Assess	DD (13) 451.5'	1980	2.3765	

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Garrison	32-D-5	Crean Silver Mines Limited	Au	Assess	VLF-EM	1981	2.3918	
Garrison	32-D-12	Foster, H.	Au	Assess	Mag, VLF-EM	1981	2.4358	
Garrison, Guibord & Michaud	42-A-8 32-D-12	Garrison Creek Consolidated Mines Limited	Au	D	Annual Report	1981		
Garrison	32-D-5	Val d'Or Explorations Limited	Au	Assess	VLF-EM, DD (7) 2 539'	1981	2.3919	
Garrison & Michaud	42-A-8	Windjammer Power & Gas Limited	Au	Assess	Mag, IP	1981	2.3976	
Gauthier	32-D-4	Casan Mining Ltd.	Au	Assess	DD (1) 305'	1981		
Gauthier	32-D-4	Hill, R. "Moose Crossing Property"	Au	Assess	Mag, GL,VLF-EM Rad	1981	2.4257	
Gauthier	32-D-4	Hoffman Exploration & Minerals Limited	Au	Assess	GL	1981	2.4447	
Gauthier	32-D-4	MacGregor, R.A.	Au	Assess	GL	1981	2.4264	
Gauthier & Lebel	32-D-4	Tower Gold Resources Limited "Commodore Group"	Au	Assess	Mag, Rad	1981	2.4295	
Gauthier	32-D-4	Tower Gold Resources Limited "Little Larder Grp"	Au	Assess	Rad, GL	1981	2.4258	
Gauthier	32-D-4	Tower Gold Resources Limited "Northland Group"	Au	Assess	Mag, VLF-EM, Rad	1981	2.4259	
Grenfell	42-A-1	Minorex Limited	Au	Assess	DD (11) 2 386'	1980-1981		
Grenfell	42-A-1	Sirola, D.G.	Au	Assess	VLF-EM, Mag	1981	2.3995	
Grenfell	42-A-1	Sirola, J.		Assess	VLF-EM GL	1982 1982	2.4254 2.4570	
Guibord	42-A-8	Armco Mineral Exploration Ltd. "Main Group Prop."	Au	Assess Assess	GL VLF-EM, Mag	1981 1981	2.4439 2.3567	
Guibord	42-A-9	Armco Mineral Exploration Ltd. "Parsons Property"	Au	Assess Assess	Mag, VLF GL	1981 1981	2.4431 2.4440	
Guibord	42-A-9	Armco Mineral Exploration Ltd. "Road Property"	Au	Assess	Mag, VLF-EM GL	1981 1981	2.4432 2.4439	
Guibord	42-A-9	Cominco Limited "Gib Property"	Au	Assess	DD (3) 1 341'	1982		
Guibord	42-A-9	Garrison Creek Consolidated Mines Limited			See under Garrison Tp.			
Halliday, Hutt, Midlothian, Mond Raymond, Sothman	41-P-14	Norcen Energy Resources Limited	Au, EM	Assess	A Mag, AEM Mag	1981 1981	2.4021 2.4273	
Halliday & Midlothian	41-P-14	Regal Goldfields	Au, EM	Assess	A Mag, AEM	1981	2.4244	
Harker	32-D-5	Amax of Canada Ltd. "Harker-2" Newmex Option	Au	Assess	DD (1) 179'	1981		
Harker	32-D-5	Amax Minerals Exploration "Harker-3"	Au	Assess	DD (7) 3 729'	1981		
Harker	32-D-5 32-D-12	Carlson, H.D.	Au	Assess	GL	1981	2.4160	
Harker	32-D-5	Kasner, R.	Au	Assess	VLF-EM, Mag	1981	2.3755	
Harker	32-D-5	Phelps Dodge Corporation of Canada Limited	Au	Assess	DD (1) 457'	1981		
Hearst	32-D-4	Canadian Nickel Company Limited "MacGregor Prop."	Au	Assess	GL	1982	2.4633	
Hearst	32-D-4	The Combined Larder Mines Limited	Au	OSC	Pros	1980	63.3875	
Hearst	32-D-4	Falconbridge Copper Corporation "James Option"	Au, EM	Assess	DD (2) 310'	1982		
Hearst & McFadden	32-D-4 31-M-13	MacGregor, R.A. "Group 3"	Au, EM	Assess	VLF-EM	1981	2.3921	

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Hearst	32-D-4	MacGregor, R.A, "Larder-Group 1"	Au, BM	Assess	Mag, VLF-EM	1981	2.3764	
Hearst	31-M-13	Noranda Exploration Company Limited "MacGregor Option" (Skead 1-80)	Au, BM	Assess	DD (2) 701'	1981		
Hearst & McFadden	32-D-4	San Rafael Resources Limited	Au	Assess	GL	1981	2.4200	
Hearst & McFadden Rattray, Skead	31-M-13 32-D-4	Superior Northwest Incorporated	Au, BM	Assess	Mag, VLF-EM DD (5) 1 992'	1981	2.3602	
Hearst & Skead	32-D-4	Utah Mines Limited	Au	Assess	Mag	1981	2.3823	
Hearst	32-D-4	Vallier, B.W.		Assess	DD (1) 120'	1981		
Hepburn	32-D-13	Asarco Exploration Company of Canada Limited			See under Bonis Tp.			
Hislop	42-A-8	Asarco Exploration Company of Canada Limited "Vimy Ridge Proj."			See under Bowman Tp.			
Hislop	42-A-8	Pamour Porcupine Mines Limited	Au	Assess	VLF-EM Mag	1981	2.4429 2.4205	
Hislop	42-A-8	Pancontinental Mining Canada Limited	Au	Assess	Mag	1981	2.4427	
Hislop	42-A-8	Parsons, G.E.	Au	Assess	VLF-EM	1981	2.4430	
Hoblitzell & Noseworthy	32-E-12	Dome Exploration (Canada) Limited "165-B"	Au, BM	Assess	DD (1) 437' Mag, HLEM	1982 1981	2.3987	
Hoblitzell	32-E-12	Dome Exploration (Canada) Limited "165-C"	Au, BM	Assess	Mag, HLEM	1981	2.3979	
Hoblitzell	32-E-12	Dome Exploration (Canada) Limited "165-D"	Au, BM	Assess	Mag, HLEM	1981	2.3978	
Hoblitzell	32-E-12	Dome Exploration (Canada) Limited "165-E"	Au	Assess	DD (2) 947' Mag, HLEM	1982 1981	2.3977	
Hincks	42-A-2	Johns-Manville Canada Incorp. "McGill Group"			See under Argyle Tp.			
Holloway	32-D-5	Amax Minerals Exploration "Holloway-2"	Au	Assess	DD (18) 9 108'	1981		
Holloway	32-D-5	Johns-Manville Canada Incorporated	Au	Assess	GL, Mag, VEM	1981	2.4413	
Hutt	41-P-14	Norcen Energy Resources Limited			See under Halliday Tp.			
Katrine	32-D-4	Rock Ore Exploration & Development Limited	Au, BM	Assess	Mag VLF-EM	1981	2.4113 2.4385	
Kerrs & Warden	42-A-9	Dome Exploration (Canada) Limited "Denison Option"	Au	Assess	Mag	1981	2.4058	
Kerrs	42-A-9	Noranda Exploration Company Limited "Kerrs 1-77"	Au	Assess	DD (6) 4 832'	1981		
Knox	42-A-9	Amax Minerals Exploration "Knox-1"	BM, Au	D	DD (1) 364'	1982		
Lawson	41-P-10	MacGregor, R.A. "Lost Lake"	Ag, Co	Assess	DD (7) 1 324'	1980-1981		
Lebel	32-D-4	Elmwood Resources Limited	Au	OSC	Pros	1981	63.3876	
Lebel	32-D-4	Jokabo Resources	Au	Assess	rTr	1981		
Lebel	32-D-4	Lampe Resource Co. Limited	Au	Assess	Mag, VLF-EM DD (1) 587'	1981 1982	2.4035	
Lebel	32-D-4	1980 E.N.R. Partnership Limited "Moffat Hall Prop"	Au	Assess	DD (3) 223'	1982		
Lebel & Morrisette	32-D-4	Rio Tinto Canadian Exploration Ltd.	Au	Assess	Mag, VLF-EM HLEM	1980	2.3523	
Lebel	32-D-4	Tower Gold Resources Ltd.			See under Gauthier Tp.			
Maisonville	42-A-1	Cedar Ridge Explorations Ltd.			See under Bernhardt Tp.			

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Maisonville	42-A-1	Goliath Mines Limited	Au	Assess	Mag DD (3) 1 294'	1981	2.3772	
Marathon	42-A-16	Noranda Exploration Company Limited			See under Bowyer Tp			
McCool	42-A-9	Placer Development Limited "Belore Option"	Au	Assess	Mag, VLF-EM, GL	1981	2.4423	
McElroy	32-D-4	Falconbridge Copper "Bastarache-Castonguay Option"	BM, Au	Assess	DD (1) 395'	1981		
McElroy	32-D-4	Falconbridge Copper Corporation "Moly Hill Project"	BM, Au Mo	Assess	Mag	1981	2.3701	
McElroy	32-D-4	Falconbridge Copper Corporation "Superior Northwest Option"	BM, Au	Assess	Mag, VLF-EM	1981	2.3746	
McElroy	32-D-4	Falconbridge Nickel Mines Limited	BM, Au	Assess	GL Mag	1981 1981	2.4276 2.4212	
McElroy	32-D-4	Lampe Resource Company Limited	BM, Au	Assess	Mag, VLF-EM	1980	2.3430	
McFadden & Hearst	32-D-4 32-M-13	MacGregor, R.A. "Group 3"			See under Hearst Tp.			
McFadden & McGarry	32-D-4	Placer Development Limited	Au	Assess	DD 1 894' GL	1981 1981		
McFadden	32-D-4	San Rafael Resources Limited			See under Hearst Tp.			
McFadden	31-M-13	Superior Northwest Incorporated			See under Hearst Tp.			
McGarry	32-D-4	Kennco Exploration (Canada) Limited "Pelangio-Larder Option"	Au	Assess	A Mag, AEM	1981	2.4380	
McGarry & Ossian	32-D-4	Noranda Exploration Company Limited	BM, Au	Assess	DD (2)	1981		
McGarry	32-D-4	Placer Development Limited			See under McFadden Tp.			
McVittie		Lenora Explorations Limited	Au	OSC	Pros	1980	63.3878	
Melba	32-D-5 42-A-8	Falconbridge Copper Corporation	BM, Au	Assess	GL	1981	2.4139	
Melba	32-D-5 42-A-8	Falconbridge Copper Corporation "Rosario Option"			See under Bisley Tp.			
Melba	42-A-8	Silver Pack Resources Limited			See under Benoit Tp.			
Michaud	42-A-8	Garrison Creek Consolidated Mines Limited			See under Garrison Tp.			
Michaud	42-A-8	Redstone Resources Incorporated	Au	Assess	DD (4) 2 980' HLEM	1982 1981	2.4014	
Michaud	42-A-8	Windjammer Power & Gas Limited			See under Garrison Tp.			
Midlothian	41-P-14	Norcen Energy Resources Limited			See under Halliday Tp.			
Midlothian	41-P-14	Regal Goldfields Limited			See under Halliday Tp.			
Mond	41-P-14	Norcen Energy Resources Limited			See under Halliday Tp.			
Montrose	41-P-14 41-P-15	Essex Minerals Company "Montrose Project"		Assess	DD (5) 1 782'	1981		
Montrose	42-A-2	Patino Mines (Quebec) Limited			See under Bannockburn Tp.			
Morrisette	32-D-4	Rio Tinto Canadian Exploration Limited			See under Lebel TP.			
Munro	42-A-9	Richmond, G.	Au	Assess	Mag (2)	1980	2.3784	
Noseworthy	32-E-12	Dome Exploration (Canada) Limited "165-A'	Au, BM	Assess	Mag, HEM DD (3) 1 163'	1981 1982	2.3986	
Noseworthy	32-E-12	Dome Exploration (Canada) Limited "165-E"			See under Noblitzell Tp.			

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Ossian	32-D-4	Lacana Mining Corporation "James-Barnard Group"	EM, Au	Assess	VLF-EM	1980	2.3538	
Ossian	32-D-4	Noranda Exploration Company Limited			See under McGarry Tp.			
Otto	42-A-1	Minorex Limited "Blanche River Prop."		Assess	DD (4) 959'	1980		
Otto	42-A-1	Vesich, Z.	Au	Assess	DD (1) 101'	1981		
Pacaud	41-P-16	Laskowski, H.	Au	Assess	DD (1) 547'	1982		
Playfair	42-A-8	Playfair Resources	Au	Assess	DD (1) 666'	1981		
Rattray & Skead	31-M-13	Noranda Exploration Company Limited	Au, BM	Assess	DD (3) 1 052'	1981		
Rattray	31-M-13	Superior Northwest Incorporated			See under Hearst Tp.			
Raymond	41-P-14	Norcen Energy Resources Limited			See under Halliday Tp.			
Rickard	42-A-10	Amax Minerals Exploration "Rickard-1"	BM, Au	D	DD (2) 522'	1982		
Rickard	42-A-10	Amax Minerals Exploration "Rickard-2"	BM, Au	D	DD (1) 548'	1982		
Rickard	42-A-10	Amax Minerals Exploration "Rickard-4"	BM, Au	D	DD (1) 659'	1982		
Rickard	42-A-10	Hollinger Mines Limited	Au	Assess	DD (1) 607'	1982		
Scapa	32-D-13	Asarco Exploration Company of Canada Limited			See under Bonis Tp.			
Skead	31-M-13	Noranda Exploration Company Limited			See under Rattray Tp.			
Skead	31-M-13	Superior Northwest Incorporated			See under Hearst Tp.			
Sothman	41-P-14	Norcen Energy Resources Limited			See under Halliday Tp.			
Stoughton	32-D-12	Noranda Exploration Company Limited (1-79")	Au	Assess	DD (2) 1 437'	1981		
Stoughton	32-D-12	Nufort Resources Incorporated "Border Group"	Au	Assess	DD (1) 2 813' HLEM GL	1982 1981	 2.4013	
Steele	32-D-13	Asarco Exploration Company of Canada Limited			See under Bonis Tp.			
Stull	41-P-6	Patino Mines (Quebec) Limited "Unwin Property"			See under Browning Tp.			
Teck	42-A-1	Argentex Resource Exploration Ltd.	Au	D	Report	1981		
Teck	42-A-1	Harrington, P.	Au	Assess	DD (3) 844'	1981		
Teck	42-A-1	Jomi Minerals and Expediting "Group B"	Au	Assess	VLF-EM	1981	2.4004	
Teck	42-A-1	Willroy Mines Limited "Pollock Claim"	Au	OSC	Report	1980	63.3827	
Terry	42-A-1	Terry Gold Explorations Incorporated	Au, Mo	Assess	DD (2) 560'	1982		
Unwin	41-P-6	Patino Mines (Quebec) Limited "Annet Option"		Assess	GL Mag, VLF-EM	1981 1981	2.4361 2.4204	
Unwin	41-P-6	Patino Mines (Quebec) Limited "Unwin Property"			See under Browning Tp.			
Walker	42-A-10	Falconbridge Nickel Mines Limited "T. Bell Property"	Au	Assess	GL	1981	2.4396	
Walker	42-A-10	Montclerg Gold Mines Limited	Au	OSC	Pros	1981	63.3879	

TABLE 4 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Walker	42-A-10	Surveymin Limited "Grid C"	Au	Assess	DD (1) 550'	1982		
Warden	42-A-9	Dome Exploration Canada Limited			See under Kerrs Tp.			
Wilkie	42-A-9	Amax Minerals Exploration "Wilkie-2"	BM, Au	D	DD (1) 581'	1982		
Wilkie	42-A-9	Nahanni Mines Ltd.	Au, BM	Assess	DD (2) 1 902'	1981		

carbonate minerals (mostly dolomite or ferroan dolomite), sericite, quartz, chert, white feldspar, and accessory pyrite and arsenopyrite. The brownish grey carbonate rock contains concentrations of gold (maximum concentration of more than 0.5 ounce gold per ton, average 0.04 to 0.1 ounce gold per ton) where it contains 2 to 10% fine-grained disseminated pyrite, especially where it is somewhat cherty ("silicified").

Gold here and in several other prospects and mines with geology resembling that of Kerr Addison Mines Limited, is concentrated in the following manner. In a shallow tectonically active restricted basin, basal sapropelic carbonaceous rock (having gold coating pyrite and "graphite") grades upward into carbonate-rich mudstone (too alkaline to precipitate gold) capped by laminated brecciated cherty carbonate (that contains feldspar formed by diagenetically altering clay) wherein gold coats pyrite or is finely divided in the chert or with arsenic and antimony sulphides. Heat from interbedded ultramafic and mafic flows remobilized the gold, carbonate, silica, and feldspar, which re-deposited as low grade gold-bearing albitite dikes, and as the erratic gold-bearing quartz-carbonate veins that typically attract most prospecting.

This account is paraphrased from Guy Hinse, Consultant, Sudbury, and L.S. Jensen, Geologist, Ontario Geological Survey, in an unpublished report, Report for Lenora Explorations Limited, 1979, in the Resident Geologists Files, Ontario Ministry of Natural Resources, Kirkland Lake.

Planet Gold Occurrence (5)

Boston Township

Previous exploration work done from 1937 to 1939 by Planet Gold Mines Limited and Howey Gold Mines Limited consisted of trenching, pitting, and diamond drilling. In 1974, Diversified Mines Limited took a bulk sample. In 1982, winter work done by 398737 Ontario Limited consisted of bush road building and dry percussion drilling at the rate of 12 to 14 holes per day, each 10 feet deep. The company planned to drill 350 holes.

The country rocks are metamorphosed basalt and intrusive porphyry. At its contact with the intrusive porphyry, the basalt is a banded, fine-grained, magnetic, black, chloritic, biotite amphibolite hornfels. The porphyry contains pink feldspar, more than 10% quartz, hornblende partly altered to chlorite and in places, biotite. It is cut by numerous quartz-carbonate veins trending at various directions. Gold and pyrite mineralization is present in veins and wall rocks in, and near pink "syenite" porphyry (monzonite and quartz monzonite). The mineralization is similar to that occurring at several other past gold producers, namely: the Canadian Arrow Property of Pamour Porcupine Mines Limited, the Garrison Township Murphy Project of Kerr Addison Mines Limited, and the Upper Beaver Property of Queenston Resources Limited.

D. Scales Gold Occurrence (6)

Lee Township

Kinojevis Group iron-rich tholeiitic basalt and related intrusives are cut by quartz-carbonate veins. Some of the carbonate is dark salmon pink coloured, possibly as a result of hematization, characteristically associated with pink feldspar porphyry of the Sesekinika area. Also present in the veins are pyrite (disseminated and as aggregations a maximum of 2 cm in diameter), a little chalcopyrite, chloritic inclusions and wallrock slip surfaces, and small grains of gold.

If continuous or *en echelon* through the sand plains between the Scales Occurrence and the similar gold mineralization at Lee Gold decline shaft, the mineralized zone occurs along a strike length 2 mining claims long.

Sullivan Gold Occurrence (7)

Maisonville Township

Iron-rich tholeiitic basalts of the Kinojevis Group are cut by grey, quartz-feldspar porphyry, and quartz veins (in places vuggy) in alteration zones. Vein minerals include yellowish green epidote, greenish black chlorite, and pink carbonate.

A trench excavated in 1978 exposed quartz-carbonate stringers, and pale, bleached, brownish grey-coloured, wallrocks containing 1 to 4% pyrite. Sampling bedrock in the trench yielded about 0.13 ounce gold per ton across 21 feet. The known length of diamond drilling by Kerr Addison Mines Limited in 1978 totals about 100 feet. This gold occurrence lines up roughly with the shaft at the Trapper Gold Occurrence 1600 feet to the north-northwest, and may represent a continuous or related *en echelon* auriferous zone.

Trapper Gold Occurrence (8)

Maisonville Township

Iron-rich tholeiitic basalts of the Kinojevis Group are cut by a north northwest-trending quartz-carbonate vein zone and fine-grained feldspathic alteration. Gold content is about 0.28 ounce gold per ton across 1.5 feet for a strike length of 200 feet. Grab samples contain *nil* to 0.75 ounce gold per ton. Vein and wall-rock mineralization in dump muck around the old shaft consists of bluish and white quartz, white and pink carbonate, pyrite as grains, and as aggregates a maximum of 1 cm in diameter, a little chalcopyrite, fine-grained brownish grey-coloured feldspathic "porcelaneous" alteration or cherty tuff, pink feldspar porphyry, and inclusions of basalt country rock. About 1000 feet in 4 or 5 diamond-drill holes was put down by J. Watling *circa* 1952, a 5-foot section of which contained appreciable gold (Dereef Lowe, Prospector, Larder Lake, personal communication, 1982)

Recommendations for Exploration

Exploration for placer gold deposits in the Kirkland Lake area has received little consideration, although large tonnages of low grade gold-bearing material amenable to inexpensive processing, using large earth-moving equipment, may be present. For a placer mining claim, regulations for staking and assessment work are the same as for mineral explorations in bedrock. Two areas received some exploration in the past, and due to the increased value of gold, have been recently further investigated. These "deposits" are not typical of placer deposits of the Yukon. They occur in esker gravels, east of Matheson in Munro Township near Fade Lake, and south of Shining Tree in Beulah and Moffat Townships near Meteor Lake.

Concentrations of gold in the gravels are low, as indicated in reports filed for assessment work at the Kirkland Lake Resident Geologist's office. Boyle (1979, p.334) however, noted that placer deposits can be worked in which the gold content is as low as 0.1 parts per million. Assays for gold content of gravels in the Fade Lake area (as reported in the Prospectus of Reoplata Mines Limited, 1952, Resident Geologist's Files, Ontario Ministry of Natural Resources, Kirkland Lake) range from trace to 0.04 ounce gold per ton. Eleven gravel samples gave an average concentration of 0.014 ounce gold per ton. One assay of sands yielded trace gold. Unfortunately, the ratio of sand to gravel is not indicated in the prospectus report, nor is the tonnage of gold-bearing gravels.

The Meteor Lake area has been explored occasionally in the past. Recently, a large amount of sampling was done to determine the potential of the "deposit". A report, filed in the Kirkland Lake Resident Geologist's office for assessment work credit by Vermilion Placers Incorporated, states that government geologists recently sampled the gravels, which were found to contain approximately 0.009 ounce gold per ton. Kennco Explorations (Canada) Limited, in a report filed in the Resident Geologist's Office, Ontario Ministry of Natural Resources, Kirkland Lake, found anomalous concentrations of gold in the Munro Esker, near Eastford Lake, in the Warden and Milligan Townships area, south of lower Lake Abitibi.

The company reported that concentrations of gold in the sediments were not determined except in a quantitative manner. Gold grains were concentrated, counted, and graded according to size. A constant sample size of 0.43 foot^3 was used. Areas containing more that 4 grains were considered anomalous. Areas were outlined, but diamond drilling failed to locate a bedrock source.

An esker sampling program by Lee (1965) counted gold grains in 1.3 feet^3 of sample. Kennco Explorations (Canada) Limited's value of 4 grains for the anomalous level, thus 12 grains for Lee's size of samples, was used. The Eastford Lake and Fade Lake areas were not found to be anomalous, but 5 areas contain more than 12 grains per sample. One of these locations is in the southwestern part of Gauthier Township, where the Munro Esker was studied recently by Cam Baker of the Ontario Geological Survey.

Baker (1981) determined that 3 depositional environments are present. These are: 1) crest, 2) ice wall channel, and 3) the flat-topped delta environments. The crest is composed of a series of stacked sequences of coarse gravels fining upwards and capped by sand (Figure 6). The highest gold concentrations (counts) found were in the ice wall channel environment (C.L. Baker, Geologist, Ontario Geological Survey, personal communication, 1982), which consists of gravels fining to sands upwards and to the south (Figure 7).

Baker (1982) has determined that the sediments of the ice-marginal channel have 2 main sources. Each of the sources have a different provenance within the glacier. These are: 1) distal material, transported high in the ice; and 2) local material sheared up from just behind the ice-front. Baker considered that most of the gold grains were local, perhaps from sources along the Larder Lake Break which underlies the ice-walled deposits. Free gold grains occurred with relatively thick units, although the distribution of gold was erratic.

The ice wall channel environment sediments are deposited subaerially in a braided stream environment, at least in the upper parts. In a discussion of origin and types of placer deposits, Lang (1970, p.251) noted that gold does not occur in payable quantities in submerged parts of deltas.

Two bore holes by Lee (1965) may be located in the ice wall channel environment described by Baker. Results indicate that gold is also found at depth, but sample size is not given, so comparison to surface results cannot be made. The local source of the gold

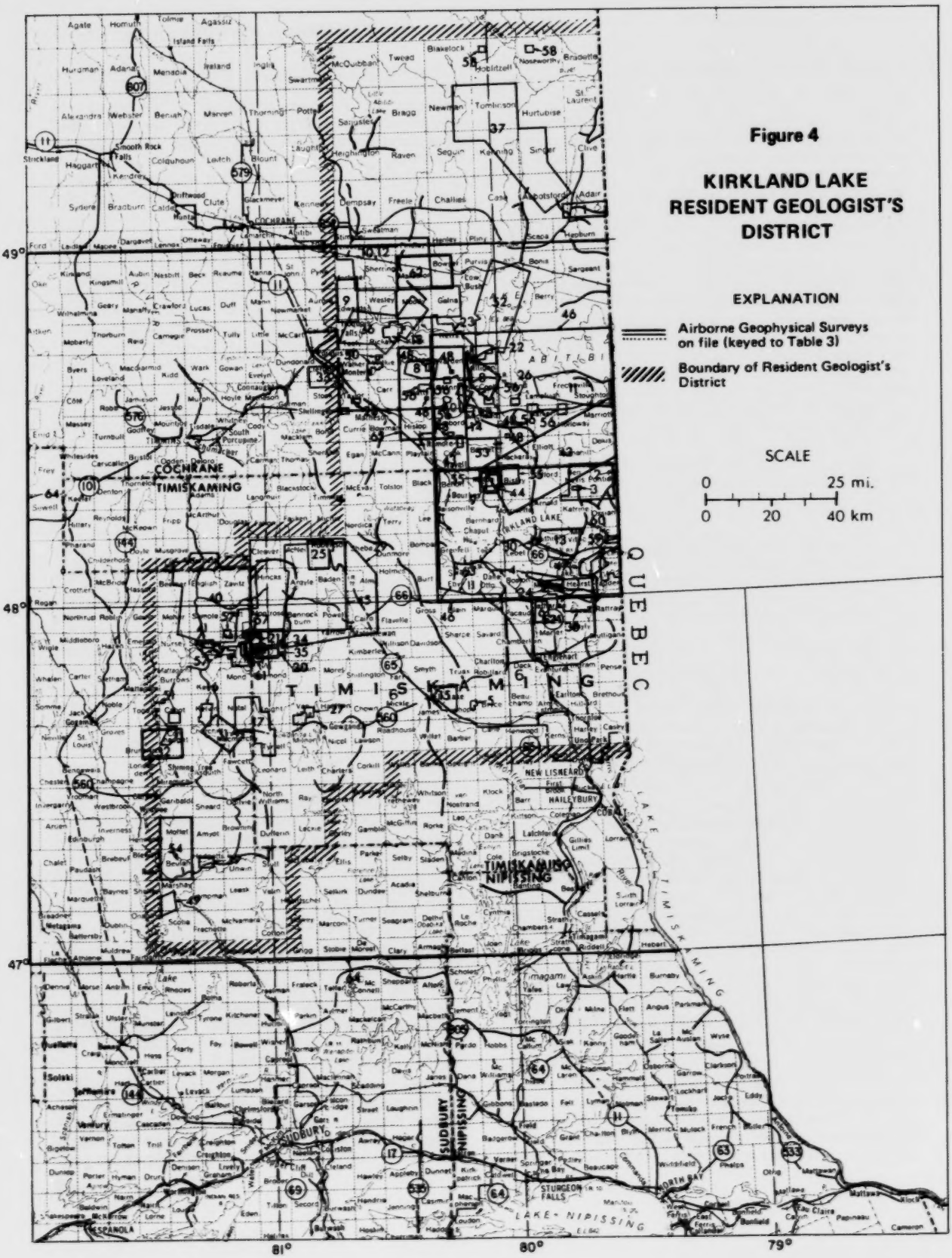
Figure 4
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT
EXPLANATION
Airborne Geophysical Surveys on file (keyed to Table 3)
Boundary of Resident Geologist's District
SCALE
0 25 mi.
0 20 40 km
COCHRANE
TIMISKAMING
KIRKLAND LAKE
NEW LISKEARD
HAILEYBURY
TIMISKAMING
NIPISSING
SUDBURY
NORTH BAY
STURGEON FALLS
LAKE NIPISSING
LAKE TIMISKAMING
ESPANOLA
QUEBEC
49°
48°
47°
81°
80°
79°

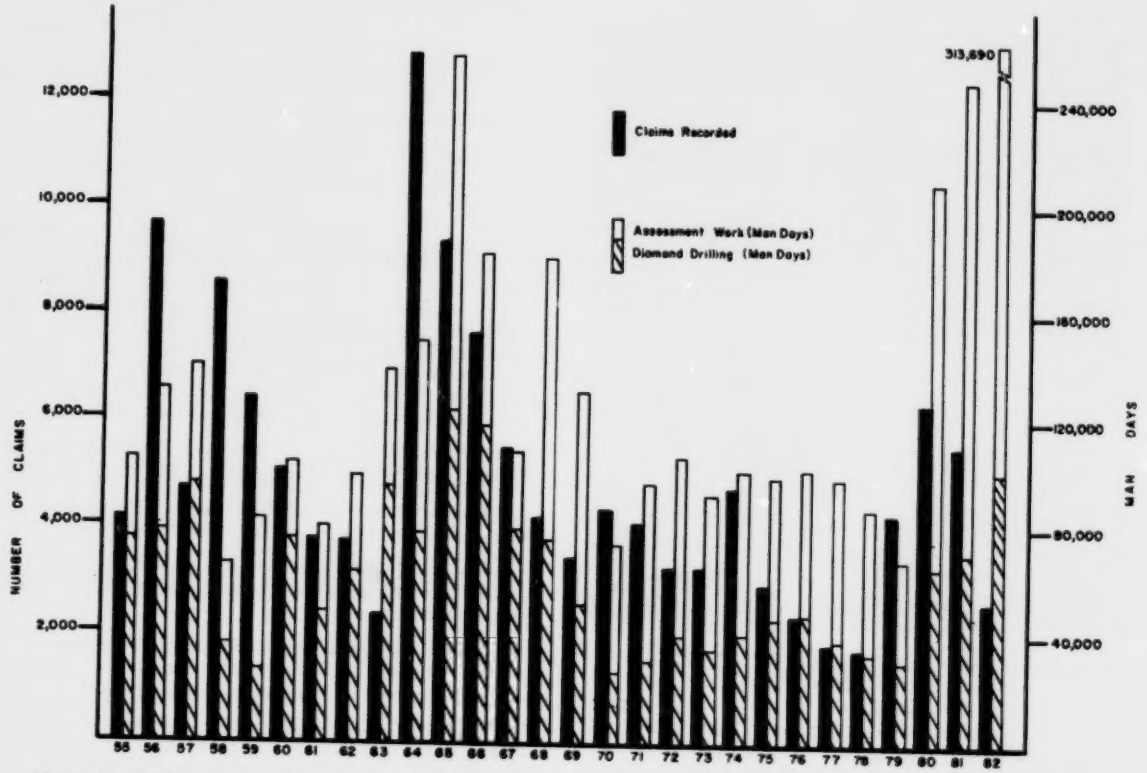

Figure 5—Exploration Activity in the Larder Lake Mining Division 1955-1982 illustrating how assessment work lags behind claim staking by one year.

was considered (Lee 1965) to be the Upper Canada Mine.

The gold in the Munro Esker may be from more than 1 source. In the case of the Eastford Lake area, 3 sources may have provided the gold, based on electron microprobe analyses for trace elements and on the fineness of a few grains (Guindon and Nichol 1982). In addition, a few grains of gold tellurides and gold-silver tellurides were found in the samples, as well as native gold.

The potential for economic recovery of gold by placer mining of the eskers is present. Subaerially deposited sediments in an ice wall channel environment appear to be the most rewarding, where gravel is the best developed. Assays of gravels in other areas indicate gold concentrations are above those considered to be subeconomic. The extent and consistency of grade in these gravels must be determined.

Ontario Geological Survey Activities

R.E. Ernst studied the structure and chemistry of mafic dike swarms in Northern Ontario covering an area extending from Latitudes 70°00′N to 49°00′N, and Longitudes 80°00′W to 85°00′W.

The first part of a multi-year program to carry out detailed, synoptic, and stratigraphic mapping along the Destor-Porcupine Fault from east of Timmins to the Quebec border was initiated by N.F. Trowell (OGS/MNA).

C.L. Baker examined the highway esker, west of Kirkland Lake, in order to compare it with the larger Munro Esker, mapped in 1981 (KLIP).

Under the direction of J.A.C. Fortescue, 50 reverse circulation drillholes, totaling 1270 m were put

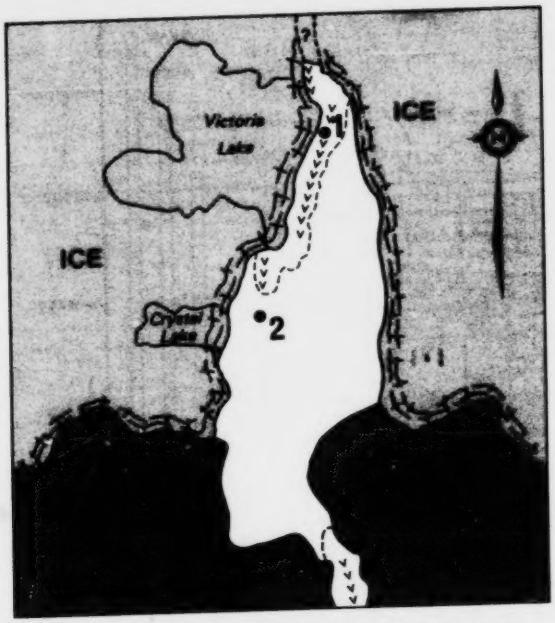

Figure 6—Reconstruction of the depositional environments of the Munro Esker, Gauthier and Lebel Townships.
Environments are: 1) crest; 2) ice-walled channel; 3)delta, dotted lines mark delta front. After unpublished report (Baker 1982).

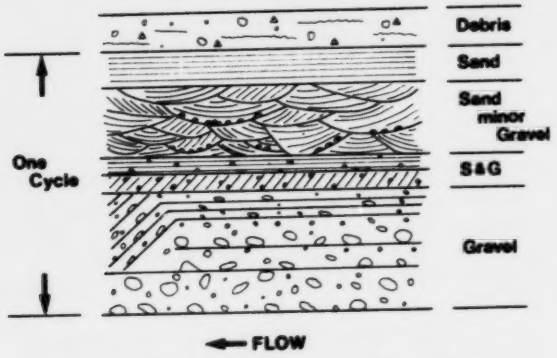

Figure 7—Crest stratigraphy, after unpublished report (Baker 1982).

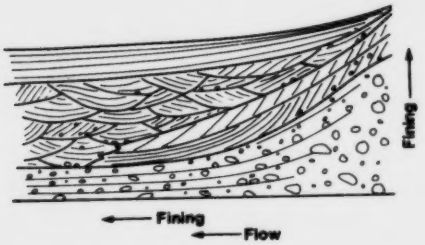

Figure 8—Iced wall channel stratigraphy, after unpublished report (Baker 1982).

down in Hearst, Catherine, McElroy, Gauthier, Arnold, Clifford, and Bisley Townships (KLIP).

M.E. Cherry studied 2 felsic intrusion associated lode gold deposits in the Matheson area.

C.J. Hodgson looked at the relationship of gold deposits of the Abitibi Belt to large scale lithostratigraphic assemblages and structures.

D.G.F. Long and C.A. Leslie investigated the placer gold potential of the Gowganda Formation along the northern margin of the Cobalt Embayment.

A.J. Andrews studied the petrology, stable isotopes, and fluid inclusions at the Ag-Co-Ni arsenide vein deposits near Cobalt and Gowganda.

Research by Other Agencies

McMaster University

J.H. Crocket: Genesis of Precambrian Iron Formations-Links with Base and Precious Metal Mineralization.

F.R. Ploeger and J.H. Crocket: Gold in the Alkalic Rocks of the Kirkland Lake area.

D.B. Saunders: Archean Variolitic Lavas from Munro Township.

Queens University

D. Guindon and I. Nichol: The Geochemistry of Free Gold and its Application in Exploration.

University of Toronto

O.M. Ilkisik *et al.*: Surface Electromagnetic Mapping in Selected Positions of Northern Ontario.

F.J. Wicks: Mineralogy and Geochemistry of the Chrysotile Asbestos Deposits of Ontario.

University of Western Ontario

L. Mansinha: Interpretation of Gravity Data from New Liskeard, Ontario.

University of Windsor

D.T. Symons: Analysis of Aeromagnetic Anomalies over Algoman-Type Iron Formations.

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1982 Report of the Cobalt Resident Geologist

Leo Owsiacki[1]

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[1]Resident Geologist, Ontario Ministry of Natural Resources, Cobalt.

Introduction

The rapidly falling metal prices of the last 2 years had an adverse affect on mining in the Region. Depressed silver prices forced the closure of the Pan Silver Mine. Depletion of ore has resulted in the pending closure of the Silverfields Mine in 1983. Production of ore at the Sherman Iron Mine decreased by 25% from the previous year.

In contrast, exploration and interest in a number of commodities remained relatively stable in comparison to the similar period in 1981. Exploration should increase further in 1983 with a firming of gold and silver prices during the winter.

The dispute between Indians of the Temagami area and the provincial government over ownership of a large tract of land (Figure 1) continues to restrict activity markedly in the Region. Numerous mineral occurrences, including Au, Ag, Pt, Cu, and U were outlined in this area in days prior to the rapid growth in precious metal prices. Settlement of the claim would no doubt result in renewed interest and exploration of many of these prospects and occurrences.

During 1982, inquiries, sales, and visitors to the Cobalt office increased markedly from the previous year. Research activities are currently being expanded in an effort to resolve many of the unsolved problems related to silver veins found in the area.

Resident Geologist's Activities

The Cobalt office is currently staffed by Leo Owsiacki, Resident Geologist, and K. Larabie, part-time secretary. R. Clarke was employed for a 14 week period during the summer as a junior field assistant.

Mapping and sampling of Lundy Township was completed on schedule. A number of new mineral occurrences and anomalous areas were subsequently outlined during this study (Owsiacki 1982). Geology and structure were found to be favourable for silver vein-type mineralization in the central, southeastern, and southwestern parts of the township.

A preliminary stable isotope-fluid inclusion joint study of silver veins and alteration in the Cobalt area was initiated during the fall (Andrews, Owsiacki, Kerrich, and Strong 1982). The objective of the study is to define the usefulness of these techniques in estab-

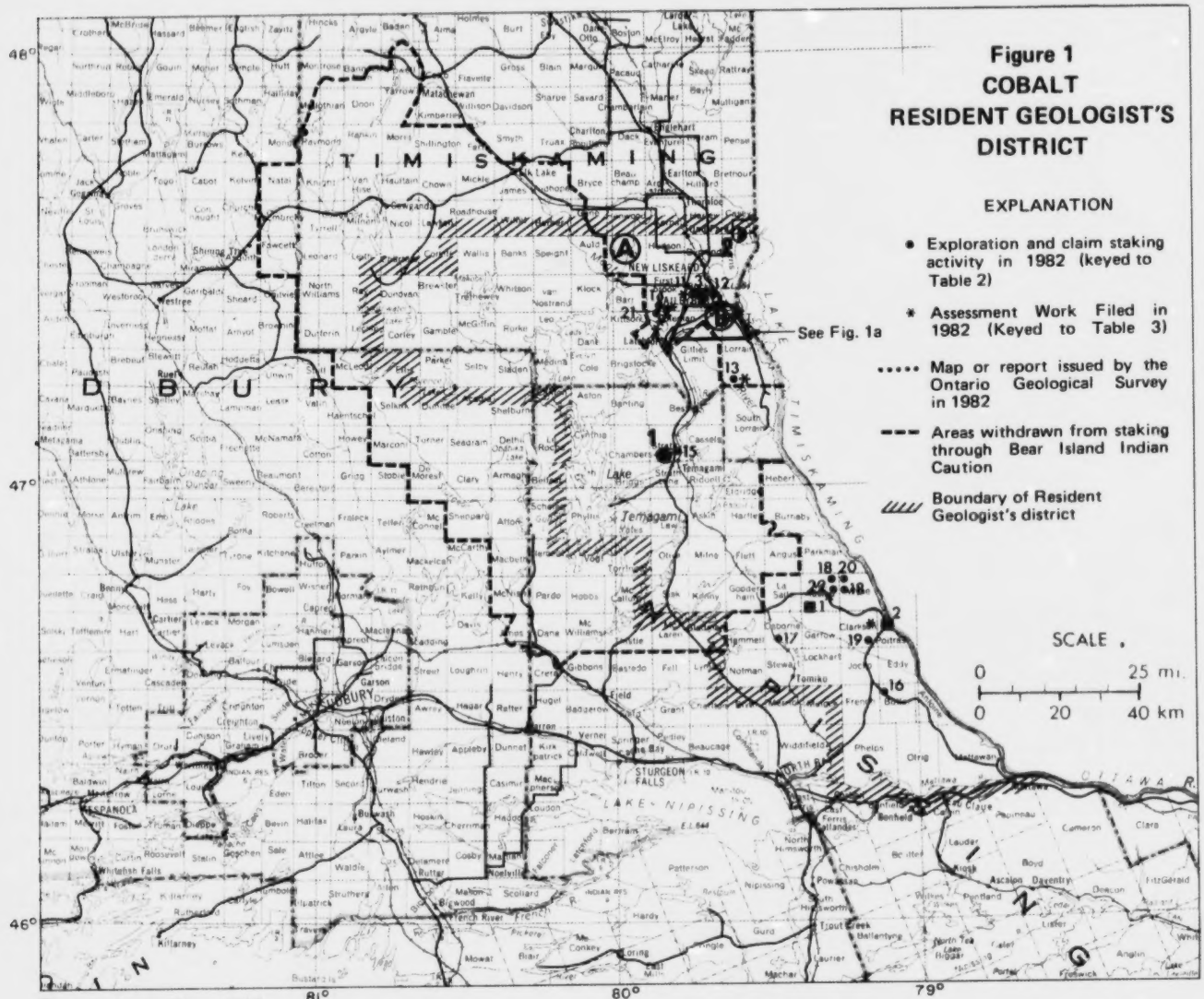

Figure 1
COBALT
RESIDENT GEOLOGIST'S DISTRICT

EXPLANATION

- • Exploration and claim staking activity in 1982 (keyed to Table 2)
- * Assessment Work Filed in 1982 (Keyed to Table 3)
- ····· Map or report issued by the Ontario Geological Survey in 1982
- – – – Areas withdrawn from staking through Bear Island Indian Caution
- ////// Boundary of Resident Geologist's district

● Producing Mines, 1982

1. Sherman Mine (Dofasco, Tetapaga Mining Co. Ltd.) . . Fe
2. Beaver-Timiskaming Mine (Agnico Eagle Mines Ltd.) . . . . . Ag
3. Silverfields Mine (Teck Corporation) . . . . . Ag

◑ Mines Under Development, 1982

1. King Edward Mine (Silver Century Exploration Ltd.) . . . . . Ag
2. Langis Mine (Agnico Eagle Mines Ltd.) . . . . . Ag

◔ Mines Producing in 1982 and Subsequently Closed

1. Pan Silver Mine (Pan Continental Mining, Canada) . . . . Ag

△ Mines Currently Maintained on Stand-by Basis

1. Conisil (Sulpetro Minerals Ltd.) . . . . . Ag
2. Lawson (Sulpetro Minerals Ltd.) . . . . . Ag
3. Cleopatra (Sulpetro Minerals Ltd.) . . . . . Ag
4. University (Sulpetro Minerals Ltd.) . . . . . Ag

■ Producing Quarries

1. McLaren's Bay Mica Stone Quarries . . Stone
2. Thorne Brilliant Stone Quarry . . Stone
3. Dymond Clay Products Ltd. . . .Lime

Ⓐ Operating Refineries

1. Agnico Eagle Refinery
2. Cobalt Refinery Ltd.

○ Operating Mills

1. Teck Corp. - Con. Summit Mill
2. Agnico Eagle Mines Ltd. Penn Mill

Ⓐ Location of Resident's Field Mapping in 1982

Ⓑ Location of OGS Field Party in 1982

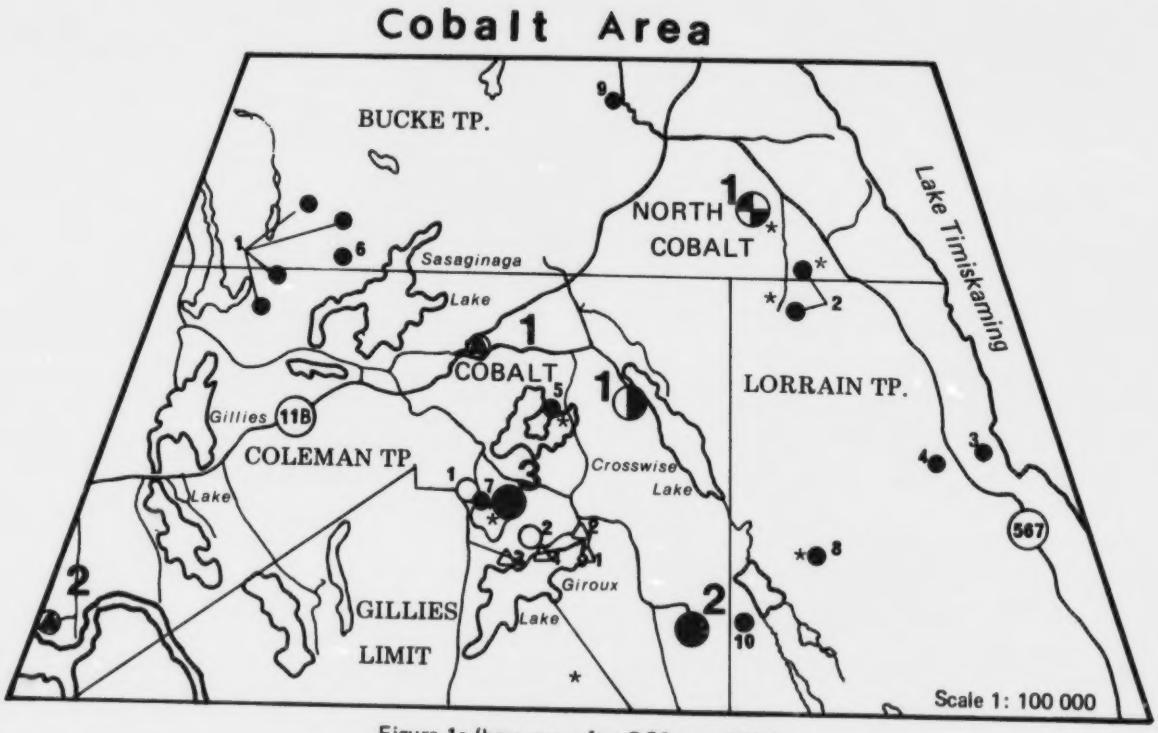

Figure 1a (base map after OGS map 5024)

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

OFR 5327
OFR 5333
OFR 5371
OFR 5382

Preliminary Maps - Geological Series

P. 2426

Preliminary Maps - Data Series

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

2229
2393

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

IMBP 2

Miscellaneous Reports

MP 77 MP 101 MP 106
MP 98 MP 103

Geological Survey of Canada Open File Reports

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1	Highland Crow Resources	Claim staking (53), linecutting, geochemical survey, geophysical survey, surface diamond drilling, Bucke and Coleman Townships.
2	Silverside Resources Ltd.	Surface diamond drilling, geophysical survey, Bucke and Lorrain Townships.
3	Hall, J.S.	Claim staking (3), prospecting, Lorrain Township.
4	Greer, P.	Claim staking (1), prospecting, Lorrain Township.
5	Silver Century Exploration	Surface diamond drilling, Coleman Township.
6	Sulpetro Minerals Ltd.	Claim staking (5), Bucke Township
7	Teck Corporation-Con. Summit Mines	Underground exploration diamond drilling, Coleman Township.
8	McAllister, R.C.	Trenching, prospecting, Lorrain Township.
9	Dupuis, R.R.	Claim staking (2), Bucke Township.
10	Marcella, G.F.	Prospecting, Lorrain Township.
11	Monopros	Till sampling, overburden diamond drilling, Bucke Township.
12	Dymond Clay Products Ltd.	Surface diamond drilling, Bucke Township.
13	Turcott, G.B.	Claim staking (5), prospecting, Lorrain Township.
14	Benner, R.	Claim staking (10), line cutting, geophysical survey, Firstbrook Township.
15	Heimetz, H.	Surface diamond drilling, Strathy Township.
16	Ruttan, M.A.	Claim staking (5), Butler Township.
17	Raillancourt, G.	Claim staking (1), Osborne Township.
18	Ranchuk, D.E.A.	Claim staking (72), Wyse and McAuslan Townships.
19	Haberer, M.J.	Claim staking (5), Clarkson Township.
20	Haberer, M.J.	Assessment work, Wyse Township.
21	Sulpetro Minerals Ltd.	Geophysical survey, Coleman and Firstbrook Townships.
22	D.L. Campbell Ltd.	Assessment work, McAuslan Township.

TABLE 3 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

SUDBURY MINING DIVISION

SYMBOLS AND ABBREVIATIONS

Ag-silver
Au-gold
Lst-Limestone
Assess-Assessment Work
BM-Base Metal
D-Donated by Company or Individual

DD-Diamond Drilling (Numbers following "DD" indicate the number of holes drilled and the total length drilled respectively)
EM-Electromagnetic Survey

GL-Geological Survey
Mag-Magnetometer Survey
OVD-Overburden Drilling (Numbers following "OVD" indicate number of holes drilled and the total length drilled respectively)

Pros-Prospectus
SA-Sampling, Assays
STr-Stripping
Tr-Trenching
rTr-Rock Trenching
VLF-Very Low Frequency

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Bucke Twp.		Pan Silver Mine	Ag	D	DD 21-5146, Mine Plans	1982		
Bucke Twp.		Monopros	-	D	OVD 10-444	1982		
Bucke Twp.		Silverside Resources Ltd.	Ag	D	DD 2-1155	1982		
Bucke Twp.		Dymond Clay Products Ltd.	Lst	D	DD 6-360	1982		
Clarkson Twp.		Selco Mining Corp. Ltd.	Au, BM	Assess	DD 4-933	1981		
Coleman Twp.		Agnico-Eagle Mines Ltd.	Ag	Assess	DD 4-3300, GL	1981		
Coleman Twp.		Agnico-Eagle Mines Ltd.	Ag	Assess	DD 1-815, VLF	1982		
Coleman Twp.		Consolidated Summit Mines Ltd.	Ag	Pros	-	1980	63.3906	
Coleman Twp.		Sulpetro Minerals Ltd.	Ag	Assess	EM, Mag	1982	2.4893	
Gillies Limit		Home, K.P.	Ag	Assess	Shaft sinking	1981		
Firstbrook Twp.		Benner, R.	Ag	Assess	VLF	1982		
Firstbrook Twp.		Sulpetro Minerals Ltd.	Ag	Assess	EM, Mag	1982		
Lorrain Twp.		Clarke, R.M.	Ag	Assess	VLF	1981		
Lorrain Twp.		Clarke, R.M.	Ag	Assess	SA	1982		
Lorrain Twp.		McAllister, R.C.	Ag	Assess	DD 4-355, STr, Tr	1980		
Lorrain Twp.		McAllister, R.C.	Ag	Assess	STr	1981		
Lorrain Twp.		Silverside Resources Ltd.	Ag	D	DD 29-14403	1982		
McAuslan Twp.		Haberer, J.	-	Assess	rTr	1982		

lishing the possible origin, transport medium, and environment of deposition of the Ag-Co-Ni arsenide veins. In addition, samples retrieved may provide a quantitative date for the mineralizing event.

Technical assistance was provided to geologists, mining engineers, and prospectors involved in a number of exploration and development projects in the area. This assistance provided included rock and mineral identification, suggestions of possible structural controls on mineralization, drill targeting, description of methods of reserve drilling, recommendation of areas potentially favourable for mineral concentration, and promotion of various new mineral commodities including cobalt, lime, and gold.

Much time was dedicated to assisting Districts in developing the mineral resource segments of District Land Use Plans and in outlining possible effects of the plans on future mining and exploration in the area.

In addition, consultative services were provided to the general public, government, prospectors, and mines. More than 50 visits were made to mines and prospects in the area. Seven inspections of potentially hazardous mine openings were carried out. Numerous field trips were run for interested parties.

An effort was made to salvage and preserve critical core, prepare up-to-date property maps of the immediate Cobalt area, compile new exploration information, and up-date geological maps of the area.

Mining Activity

The recession which began to dramatically affect the mining industry in 1981, deepened during the current year. Locally, Pan Continental Mining (Canada) Limited was forced to close the Pan Silver Mine, 1 year after start-up, due to depressed silver prices.

The Silverfields Mine (Teck Corporation) announced earlier that operations will soon cease and mine closure will follow early in 1983 due to depletion of ore.

The Sherman Mine was shut-down for an 11 week period during the summer, and it was recently announced another summer shut-down is to begin in August 1983.

Only 2 of the 3 mills in the area operated during the year. Teck Corporation's Consolidated Summit Mill maintained continous operations, whereas the Penn Mill of Agnico-Eagle Mines Limited operated for a 7 month period only.

On a more positive note, sufficient silver ore has been outlined at the Langis Mine of Agnico-Eagle Mines Limited to warrant initial limited production. The company also solidified their position in the Cobalt camp by purchasing the CS&R refinery from Sulpetro Minerals Limited earlier in the year. Operations resumed in May and continued at close to 80% capacity for the remainder of the year. All feed is presently from the mines of Agnico-Eagle Mines Limited in the area.

Plans are presently being reviewed by Cobalt Mines Metals to rebuild the Cobalt Refinery as a custom refinery which could recover Au, Ag, Cu, Co etc. from high arsenic concentrates.

Mineral commodities mined in 1982 included silver (1 008 425 ounces), iron ore pellets (863 000 million tons), copper (52 306 pounds), limestone (2101 million tons), decorative building stone (1500 million tons), and sand and gravel.

Beaver-Temiskaming Mine (Agnico-Eagle Mines Limited)

Continuous silver mining, exploration, and development was carried out in 1982. Principle ore veins include Numbers 37, 38, 41, and 44 which are being developed from the 16th level and the 14th sub-level.

The rehabilitation and deepening of the Temiskaming shaft, completed in July, increased hoisting capacity substantially. A new level, at a depth of 1330 feet, is presently being driven to the developing ore veins.

A crosscut was driven to the southwestern part of the property on the 16th level early in the year. Extensive diamond drilling was subsequently carried out on a promising vein structure located near an Early Precambrian (Archean) interflow sediment band.

Langis Mine (Agnico-Eagle Mines Limited)

Two new veins were discovered by diamond drilling from the 235-foot level early in 1982. Silver ore is present in one of the veins which cuts Huronian sediments immediately above an unconformity with Keewatin volcanic rocks. Access and exploration drilling is via the Number 3 shaft which was rebuilt and dewatered in 1980. The Number 6 shaft and levels are accessible from the 235-foot level of the Number 3 shaft, and workings are presently being dewatered.

A crosscut was recently driven on the 5th level beneath the newly discovered silver-bearing vein structure. A raise is being emplaced and limited mining is planned to begin in early 1983.

Pan Silver Mine (Pan Continental Mining (Canada) Limited)

Prior to mine closure in March 1982, development took place on 3 levels. On the bottom, or 290-foot level, 2 stopes were worked on the main Number 1 vein. This vein is associated with a major shear in Keewatin mafic volcanics and interflow sediments. It carries appreciable copper and quartz in addition to the normal cobalt-silver-arsenide assemblage. A sample of the vein from the bottom level contained 0.022 ounce gold per ton and 0.03% Mo. The vein and shear on this level are quite strongly developed and have not been drilled beneath the level. One stope was developed on the 240-foot level on a branch or extension

of the main Number 1 vein. The bulk of mining was carried out on the 190-foot level where veins Number 23, Number 23A, and Number 24 were stoped.

The mine was allowed to flood at the end of October 1982. A number of the stopes and drift faces were still in ore grade silver. Depth extensions are unknown for some of the veins.

Approximately 69 000 ounces of silver were produced during the 1 year life of the mine.

Sherman Mine (Dofasco Incorporated and Tetapaga Mining Company Limited)

Both the mine and plant were shut-down for an 11 week period during the summer months because of the depressed steel industry. Pellet production was down to 850 000 long tons from the 1 135 000 tons produced in 1981.

Seventy-five percent of crude ore was mined from the central part of the West Pit and 25% was mined from the South Pit. Widening of the pits to allow greater mining depth continued throughout the year. Trees were timbered over the East Pit site and stripping of overburden is planned for 1983 in preparation for eventual development.

Silverfields Mine (Teck Corporation)

Mining continued throughout the year. Production and grade of silver were maintained. Much of the ore was mined from a stope on the 4th level and vein remnants on the 5th level. A joint venture exploration program undertaken on the adjoining Consolidated Summit Mines claim did not prove up any substantial new ore. As a result, mine closure has been announced, and will occur upon depletion of ore and stockpiles in early 1983.

Industrial Minerals

Exploration and development of industrial minerals in this area received little serious consideration in the past. Limited quarrying of limestone as a source of agricultural lime and road fill has been sporadically undertaken in the Tri-Towns in the past. Building stone is presently being quarried in McAuslan and Poitras Townships. Potential for development of certain commodities is quite high in the Region, with an expanding market for these and other industrial minerals, increased development of the north, an increase in transportation costs, and decrease of resources in southern Ontario.

Recent drilling and sampling of Ordovician limestones near Haileybury by Dymond Clay Products Limited has outlined the presence of shallow, but extensive high CaO beds (48% to 53% CaO). The potential presently exists for development and production of good quality lime which could be used in various smelter operations in northern Ontario and Quebec. The Lake Temiskaming Paleozoic outlier may represent one of the few accessible high quality lime sources north of Toronto. Plans are presently underway to expand a small existing agri-lime operation to include production of both high grade lime and agricultural lime.

A large limestone (dolostone?) quarry was recently brought into production on the eastern shore of Lake Temiskaming by Exploration Aiguebelle Limited. Annual production capacity is 125 000 tons. Sales forecast for the first 6 months of operation is 35 000 tons (Northern Miner, September 1982) of lime to be used in the agricultural industry.

A trip to the Tweed/Bancroft area this spring included a visit to a small, flake mica (muscovite) prospect. Interest in this material, particularly on the part of the Japanese, is increasing because of its use as a filler in the automobile and plastics industry. The grade of mica sought is approximately 2 mm size, >50% muscovite with few impurities, and depending on quality, can sell for up to $1000 per ton (P. Kingston, Resident Geologist, personal communication, 1982). Muscovite-rich gneisses are described from Grenville age rocks northeast of North Bay (Lumbers 1971). Detailed investigation of some of these areas may outline similar potential deposits of small flake mica.

Vermiculite, used as an insulator and as aggregate in concrete and plaster, is also found in the area. A prospect in Butler Township has been staked and worked repeatedly in the past few years. Potential exists for discovery of similar occurrences in the area. In addition, kyanite has been described from numerous locations in Butler and Antoine Townships. Previous assessment work took place in some of these areas as recently as 1976. Kyanite is most important for its refractory properties, and is used in furnaces and as a lining for burners (Minnes 1982). These properties may prove useful in processes currently being applied in numerous pulp and waferboard plants located in the northern parts of the province.

Silica is another important industrial mineral which is used in a variety of processes including glass making. Silica-rich sands and relatively pure quartzites can be found in the region, and should be investigated further as to their potential economic development.

The preceding descriptions provide only a brief summary of known industrial minerals in the area. Many more will undoubtedly be discovered when sufficient interest is generated in exploring for further occurrences.

Exploration Activity

Exploration during the year was focused primarily on silver. However, interest was expressed in other commodities including gold, diamonds, limestone, and base metals. Claim staking decreased by 10%. Total

underground exploration diamond drilling decreased 14.5% to a total length of 55 854 feet (Figure 2). Total surface exploration diamond drilling increased by 6% to a total length of 23 671 feet. Although the recession and falling commodity prices adversely affected mine production and profits, exploration activity as a whole decreased by less than 10% relative to the similar period in 1981.

Interest in cobalt rapidly disappeared as prices fell a further 50% to U.S. $4.65, after a 60% drop in value during the previous year. Silver on the other hand, after reaching lows of less than U.S. $5.00 in mid-summer is beginning to strengthen with prices in November and December 1982 being in the range of U.S. $10 to $11.

Major exploration undertaken during 1982 is summarized as follows:

Agnico-Eagle Mines Limited continued an extensive underground diamond-drill program at the Langis Mine (Casey and Harris Township) and met with some success. Exploration for silver continued in the Portage Bay area, but surface diamond drilling of conductive horizons produced inconclusive results. It was hoped that Keewatin interflow sediments and associated silver veins would be intersected, but none of the holes were put through Nipissing Diabase or Firstbrook Member Huronian metasediments.

Silverside Resources Incorporated resumed diamond drilling on claims in Bucke and Lorrain Townships. Thirty holes were put down during the year. Of these, a number intersected carbonate veins with silver, cobalt, and copper. One promising zone was outlined approximately 2000 feet southeast of the past-producing Pan Silver Mine. Ore vein structures trend in both a northerly and easterly direction in this part of the camp.

Silver Century Explorations Limited resumed work on their ground in the Peterson Lake/Cross Lake area in July. Two deep drillholes were extended beneath Peterson Lake to explore the base of the Nipissing Diabase. At the underground workings of the former King Edward Mine, a delineation drill program was concluded, and a long exploration crosscut started. This crosscut will eventually reach the past-producing Nova Scotia Mine Property to the west. It is being driven through Keewatin volcanic rocks beneath the Nipissing Diabase sill, and will provide the access for a proposed extensive drill exploration program.

Highland-Crow Resources Limited and Copperfields Mining Corporation teamed up to stake in excess of 70 claims in Bucke and Coleman Townships over the last 2 summers. An extensive geochemical and geophysical program was conducted during 1982. Results were encouraging enough to initiate a 4500-foot diamond drilling program that was underway at the time of writing (November 1982). The objective is to find possible silver-bearing structures which may be associated with Keewatin interflow sediments present below Gowganda Formation conglomerates. The most promising areas are located west and north of an exposed Keewatin ridge. The eastern side of this ridge is characterized by similar conglomerates which hosted many of the high grade silver veins originally discovered in Cobalt.

R. Benner holds a claims group in Firstbrook Township which is partly underlain by an inlier of Early

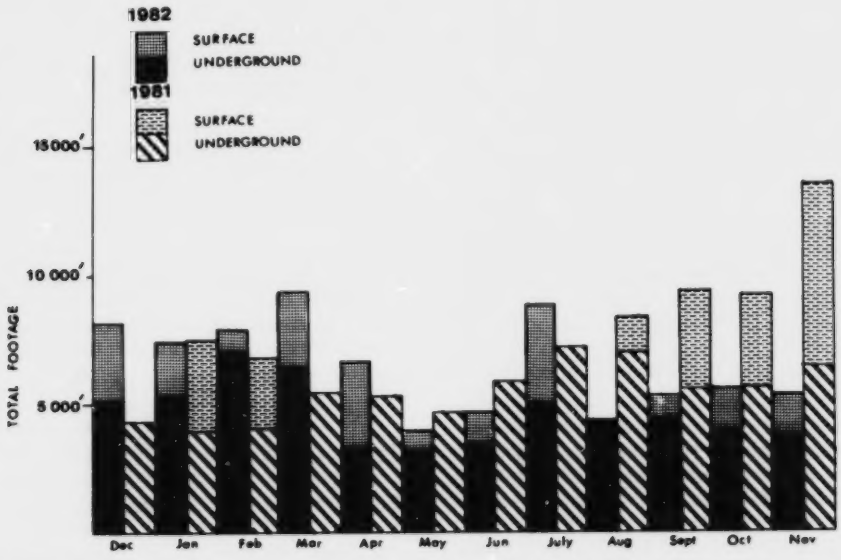

Figure 2 – Exploration diamond drilling activity in the Cobalt Resident Geologist's area.

Precambrian (Archean) metavolcanics. Line-cutting and a detailed VLF survey were undertaken during the year. A number of interesting structures were subsequently outlined. A spatial relationship of silver veins to Early Precambrian (Archean) interflow sediments and Nipissing Diabase, and the presence of exposed nearby cobalt occurrences are the basis for exploration.

Numerous prospectors have been searching for silver in several townships, including the townships of Coleman, Lorrain, Lundy, Bucke, and Van Nostrand.

Sulpetro Minerals Limited conducted a minimal amount of exploration in the area. A ground geophysical survey was run near McLaren Lake in Coleman Township and a few claims were staked in Bucke and Coleman Townships.

Monopros, a subsidiary of Anglo American Corporation Limited, opened an exploration office in the Tri-Towns District, and conducted regional till sampling and soil geochemical programs during the year over a large part of the northern part of the district. Several overburden holes were diamond drilled in Bucke Township.

Interest in the area was expressed by a number of companies including Inco Limited, Sherritt Gordon Mines Limited, Kidd Creek Mines Limited, Asarco Exploration Company of Canada Limited, and MINPRO Limited.

A more complete summary of exploration activity in the Cobalt Resident Geologist's District in 1982 is provided in Table 2 and Figures 1 and 1a. Data submitted for assessment purposes are summarized in Table 3, and recent Ontario government publications are listed in Table 1.

Ontario Geological Survey Activities

Geophysics/Geochemistry Section

Interpretation of gravity and magnetic data over a large area including Cobalt, Temagami, and North Bay is continuing (Gupta 1981, 1982). One aspect of the study was to establish the thickness of Huronian strata in the Cobalt Embayment. This does not appear to be feasible because of the nature of the rock types involved. However, mapping of Early Precambrian basement lithologies beneath Huronian metasediments has been relatively effective.

Mineral Deposits Section

Long and Leslie (1982) studied the paleoplacer gold potential of the Gowganda Formation comprising the northern margin of the Cobalt Embayment. The work established that the rocks did not have a fluvial origin. Thus, potential for paleoplacer-type gold concentrations is poor in this particular strata.

Owsiacki (1981, 1982) concluded detailed mapping and sampling of Lundy Township. Areas with favourable geology and structures for silver vein-type mineralization were identified. Numerous mineral occurrences were found, and lithogeochemical anomalies outlined.

A preliminary investigation was initiated by Andrews, Owsiacki, Kerrich, and Strong (1982) to study the petrology, stable isotopes, and fluid inclusions of Ag-Co-Ni arsenide vein deposits in the Cobalt-Gowganda camps. Results of the studies may add to the, at present, poorly understood problems of the area which include a lack of quantitative dates for mineralization, cause, and control of alterations, sources of vein minerals and so on.

Research by Other Organizations

McMaster University

Two projects, under the auspices of the Ontario Research Grant Program, are currently underway, and are being supervised by J.H. Crocket and R. McNutt. The first investigation deals with the genesis of Precambrian iron formations and their possible links with base and precious metal mineralization. Two PhD students, N. Blam and R. Bowins, will attempt to establish if any relationship exists by conducting isotope studies including oxygen, sulphur, and carbon and trace element studies of banded iron formation samples from the Sherman and Adams Mines.

A second project, by MSc student T. Hurley, involves mapping and geochemical sampling of felsic volcanic horizons in the vicinity of the Central and South Pits at the Sherman Mine.

Carleton University

M. Goodz, a MSc student supervised by D. Watkinson, has begun a sampling and mapping project at the Beaver-Temiskaming Mine near Cobalt. Stable isotope studies will be applied in an effort to establish the genesis and relationship, if any, of silver in veins and sulphides in Early Precambrian (Archean) volcanics.

Recommendations for Exploration

Recent studies by Colvine (1981, 1982) have indicated that rocks of the Middle to Upper Lorrain Formation of the Huronian Supergroup, particularly hematitic orthoquartzites and quartz pebble conglomerates, return anomalous values of gold. These values suggest that past sedimentary processes did actively concentrate gold in a placer manner. Whether or not these systems were capable of deposit-size concentrations

remains to be discovered. Favourable rocks are presently confined to the northern and western parts of the Cobalt Embayment. Mapping and sampling of parts of the Lower Lorrain Formation on the eastern margin of the Embayment tends to support this thesis (Owsiacki 1982). Surprisingly, lithogeochemical data has revealed that laminated argillites of the Gowganda Formation contain the highest background Au of all lithologies in this area. An average background of >5 parts per billion Au was obtained in Lundy Township from these metasediments with 1 sample containing 180 parts per billion Au (Owsiacki 1982).

The potential for discovery of silver vein-type deposits is very good in the recently mapped Lundy Township of which only a limited area is open to exploration. A lack of past exploration, the presence of numerous occurrences of arsenide and sulphide minerals in veins and rocks similar to those found in Cobalt, and the presence of some extensively altered Huronian rocks, provides a real basis for further exploration. An area with similar characteristics is located in the southwestern corner of Lorrain Township.

The potential remains high for discovery of further industrial mineral resources in various parts of the region, as described in the Industrial Minerals section.

Recent Publications and References

Andrews, A.J., Owsiacki, Leo, Kerrich, R.W., and Strong, D.F.

1982: Petrology, Stable Isotopes, and Fluid Inclusions of the Ag-Co-Ni Arsenide Vein Deposits near Cobalt and Gowganda, Ontario; p.207-209 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Colvine, A.C.

1981: Reconnaissance of the Lorrain Formation, Northern Cobalt Embayment; p.187-189 *in* Summary of Field Work, 1981, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 100, 255p.

1982: introduction to Mineral Deposits Programs; p.172 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Donaldson, J.A., and Munro, I.

1982: Excursion 16B: Precambrian Geology of the Cobalt Area, Northern Ontario; Field Excursion Guide Book of the Eleventh International Congress on Sedimentology.

Finn, G.C., Edgar, A.D., and Rowell, W.F.

1982: Petrology, Geochemistry, and Economic Potential of the Nipissing Diabase; Grant 100, p.43-58 *in* Geoscience Research Grant Program, Summary of Research, 1981-1982, edited by E.G. Pye, Ontario Geological Survey, Miscellaneous Paper 103, 219p.

Gupta, V.K.

1981: A Gravity Study in North-Central Ontario, Districts of Sudbury, Nipissing and Temiskaming; p.160-164 *in* Summary of Field Work, 1981, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 100, 255p.

1982: Gravity and Aeromagnetic Studies in North-Central Ontario; A Progress Report; p.165-167 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by J. Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Long, D.G.F., and Leslie, C.A.

1982: Placer Gold Potential of the Gowganda Formation Along the Northern Margin of the Cobalt Embayment; p.198-200 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Lumbers, S.B.

1971: Tomiko Area (East Half); Ontario Geological Survey, Preliminary Map P.679, Geological Series, scale 1:63 360 or 1 inch to 1 mile.

Mansinha, L., and Wilkinson, D.A.

1982: Interpretation of Gravity Data from New Liskeard, Ontario; Grant 109, p.119-125 *in* Geoscience Research Grant Program, Summary of Research, 1981-1982, edited by E.G. Pye, Ontario Geological Survey, Miscellaneous Paper 103, 219p.

Minnes, D.G.

1982: Ontario Industrial Minerals; Ontario Geological Survey, Industrial Mineral Background Paper 2, 52p.

Owsiacki, L.

1981: Geology of Lundy Township, District of Temiskaming; p.214-217 *in* Summary of Field Work, 1981, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 100, 255p.

1982: Geology of Lundy Township (Northern Half), District of Temiskaming; p.201-206 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

1982 Report of the Sault Ste. Marie Resident Geologist

Gerald Bennett [1]

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[1]Resident Geologist, Ontario Ministry of Natural Resources, Sault Ste. Marie.

Introduction

As 1982 began, there were signs that it would be a bleak one for mineral exploration in the Sault Ste. Marie Mining Division. Claim staking activity was down over past years with only 2 claims being recorded in February.

Several exploration companies have been active in the area in previous years. These companies started to cut back on their activities and reassessed their projects in the Sault Ste. Marie Mining Division during 1982.

However, during the summer of 1982, the successful results of exploration in the Hemlo area by Long Lac Mineral Exploration Limited, Goliath Gold Mines, and Teck Corporation were reported. It became apparent that a new gold mining camp was in the making at the northern edge of the Sault Ste. Marie Mining Division. During the fall of 1982, a major staking rush was in progress in the Hemlo and Michipicoten areas. As a result, the total claims recorded in the Sault Ste. Marie Mining Division in 1982 was the second highest in the last 20 years.

Resident Geologist's Activities

The staff in the Sault Ste. Marie Office consists of: E.J. Leahy, Resource Geologist; Lorry J. Ashick, Geological Assistant; Brenda Fremlin, Secretary; and Gerald Bennett, Resident Geologist.

During the summer of 1982, the Resident Geologist visited 7 active mining properties, 6 inactive mineral deposits, and 3 operating mines.

Two weeks were spent carrying out detailed mapping in the northeastern part of Aweres Township. A brief description of the results of this mapping is included in this report.

A sampling program was initiated to test the potential of the sedimentary rocks of the Thessalon Formation for placer-type gold deposits. A summary of the very preliminary results to date is also included in this report.

Much of the Resident Geologist's time was spent supervising a program to collect diamond-drill core for eventual inclusion in the Sault Ste. Marie Drill Core Library. Construction of this facility is to begin in early 1983.

The following are some of the main duties that the Resource Geologist was concerned with during 1982.

(a) Following the publication in January of the brochure entitled "Sault Ste. Marie's Geological Past-An Introduction" a 10-drawer cabinet kit of teaching aids was assembled for use by elementary and high school teachers. It consists of 67 select fist-sized specimens of rocks, minerals, and miscellaneous items, along with a relevant group of 26 maps, brochures, and books, and has been placed in the custody of the Resource Centre of the Sault Ste. Marie Public School Board.

(b) Implementation of the microfiche system for exploration data files continued at this office from January to November. It is virtually complete and in use by our office visitors. The numerous details involved in this were done mainly by our geological assistant, Lorry Ashick, under the guidance of the Resource Geologist.

(c) The design of the new publication type referred to as the "Geological Data Inventory Folio" was finalized, and guidelines for their preparation were written up. The first folio of this series, GDIF 1, Lumsden Township, compiled by R. Adlington of the Sudbury Resident Geologist's Office, was released on December 8, 1982. Other townships are presently being compiled in this format by Lorry Ashick and the Resource Geologist.

(d) The rest of the Resource Geologist's time was mostly concerned with Land Use Planning, office moves, assistance to office visitors, and a minor amount of field work.

Mining Activity

The Algoma Ore Division of the Algoma Steel Corporation Limited continued production of iron ore at Wawa, although at a reduced rate. Total production of sinter from January 1, 1982 to November 30, 1982 was 891 610 tons. During the same period of 1981, the production was 1 337 977 tons.

Denison Mines Limited and Rio Algom Mines Limited continued their expanded production of uranium oxide at Elliot Lake.

Denison Mines Limited recently announced that it will conduct a heap leaching test on up to 200 000 tons of low grade uranium ore in 1983. A test on a 40 000 ton bulk sample was carried out with good results in 1982 (Northern Miner, November 25, 1982).

Renabie Mines Limited, a wholly owned subsidiary of Sungate Resources Limited, continued operation throughout 1982. From January 1, 1982, to November 30, 1982, 140 813 tons were milled at Renabie. The Northern Miner of September 23, 1982, reported that the production for the second quarter averaged 14 000 tons per month with an average mill head grade of 0.19 ounce gold per ton.

The Prace Mining Company went into receivership in the summer of 1982. The company operated a small lead-silver mine in Vankoughnet Township during part of 1981. A total of 112 tons of concentrates were shipped from the Prace Deposit in 1981.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

G.R. 210
G.R. 218

Open File Reports

O.F.R. 5366
O.F.R. 5375
O.F.R. 5393

Preliminary Maps - Geological Series

P. 2426
P. 2439
P. 2440
P. 2441
P. 2442
P. 2560
P. 2580
P. 2581

Preliminary Maps - Data Series

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

3439
3448

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

Brochure 5252

Geological Survey of Canada Open File Reports

O.F.R. 879

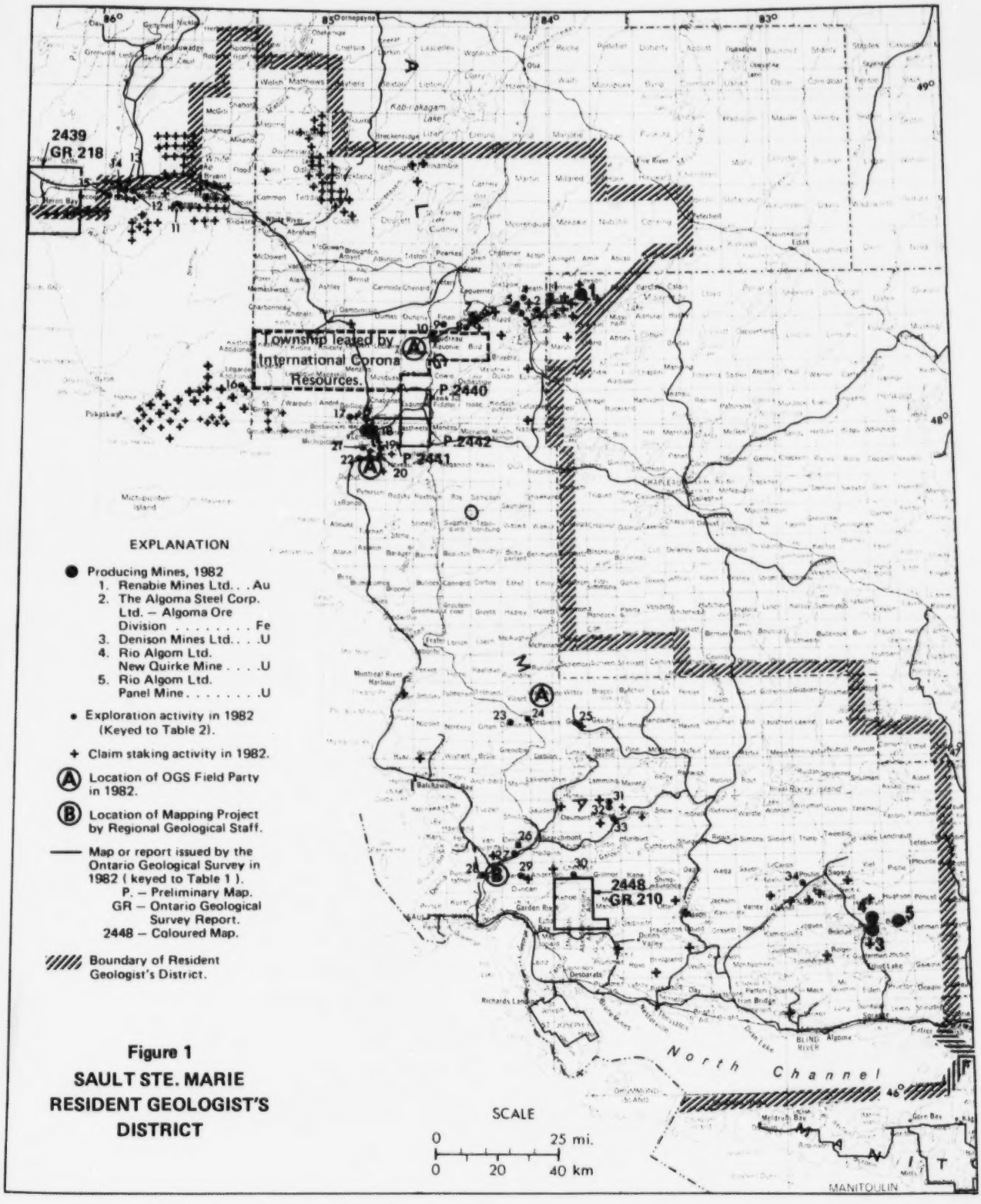
2439
GR 218
Township leased by International Corona Resources.
P.2440
P.2442
P.2441
2448
GR 210
North Channel
MANITOULIN
EXPLANATION
Producing Mines, 1982
1. Renabie Mines Ltd. . . Au
2. The Algoma Steel Corp. Ltd. – Algoma Ore Division . . . . . Fe
3. Denison Mines Ltd. . . .U
4. Rio Algom Ltd. New Quirke Mine . . . .U
5. Rio Algom Ltd. Panel Mine . . . . . .U
Exploration activity in 1982 (Keyed to Table 2).
Claim staking activity in 1982.
Location of OGS Field Party in 1982.
Location of Mapping Project by Regional Geological Staff.
Map or report issued by the Ontario Geological Survey in 1982 (keyed to Table 1).
P. – Preliminary Map.
GR – Ontario Geological Survey Report.
2448 – Coloured Map.
Boundary of Resident Geologist's District.
SCALE
0 25 mi.
0 20 40 km

Figure 1
SAULT STE. MARIE RESIDENT GEOLOGIST'S DISTRICT

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1.	Mattagami Lake Exploration Limited	Drilling, E.M., Mag.,Rennie Township
2.	Mattagami Lake Exploration Limited	Drilling, E.M., Mag.,West Township
3.	Mattagami Lake Exploration Limited	Drilling, E.M., Mag.,West Township
4.	Noranda Exploration Co. Limited	E.M., Mag., Diamond Drilling, Meath Township
5.	Mattagami Lake Exploration Limited	E.M., Mag., Diamond Drilling, Meath Township
6.	R.O.K. Engineering Limited	Geological mapping, sampling, Cline Mine, Jacobson Township
7.	Anaconda (Canada) Exploration Limited	Mapping, Jacobson Township
8.	Mattagami Lake Exploration Limited	Drilling, E.M.,Mag., Jacobson Township
9.	Cavendish Investing Ltd.(Magino Joint Venture)	Shaft dewatering, Drilling, Geological Mapping, Finan Township
10.	Noranda Exploration Co. Limited	Geological Mapping, Aguonie Township
11.	Long Lac Mineral Exploration Limited[1]	Geological Mapping, Airborne E.M., Mag., Scint., some Geochem., Brothers, Laberge, McCron Townships.
12.	Goliath Gold Mines Limited[1]	Diamond Drilling, Geological Mapping, Bomby Township
13.	Teck Corporation (International Corona option)[1]	Geological Mapping, Diamond Drilling, Bomby Township
14.	Golden Sceptre Resources Limited[1]	Geological Mapping, Trenching, Drilling, Geophysics, Geochem., Bomby Township
15.	Bel-Air Resources Limited[1]	Drilling, Trenching, Lecours Township
16.	Westfield Minerals Limited	Basal till sampling, Rock sampling, Trenching, Mishibishu Lake area
17.	Osisko Mines Limited	Claim staking, Prospecting, Bailloquet and Lendrum Townships
18.	Dunraine Mines Limited	Prospecting, Sampling, McMurray Township
19.	Canabec Explorations Limited	Drilling, Rabazo Township
20.	Gold Monk Explorations Limited	Trenching, Sampling, Rabazo Township
21.	Algoma Steel Corporation Limited	Prospecting, E.M., Mag., Rabazo Township
22.	Longhurst, G.	Road construction to Ranson gold deposit, Rabazo Township
23.	Hammar, Dale and Bridge, R.	Trenching, Sampling, Prospecting, Davieaux Township
24.	Giroux, Richard	Prospecting, Trenching, Sampling, Davieaux Township
25.	Fraser, R.J.	Prospecting, Sampling, Gapp,Lunkie and Gaudry Townships
26.	Mississagi Mining Inc.	Drilling, Deroche Township
27.	McNellen Resources Limited	Drilling, Deroche Township
28.	Highland-Crow Resources Limited	Geological Mapping, Sampling, Aweres Township
29.	Longbow Explorations Limited	Prospecting, Trenching, Sampling, Jarvis Township
30.	Haugeneder, John	Diamond Drilling, Prospecting, Chesley Township
31.	Flemming, Dennis	Prospecting, Sampling, Hughes Township
32.	McNellen Resources Limited	Diamond Drilling, Hughes Township
33.	Canadian Nickel Company Limited	Geological Mapping, E.M., Mag., Diamond Drilling, Hughes Township
34.	Utah Mines Limited	Geological Mapping, E.M., I.P., Mag., Poulin Township

[1] For a more complete report of this work see the report of the Thunder Bay Resident Geologist in this volume.

Exploration Activity

In recent years, the focus of exploration activity in the Sault Ste. Marie Mining Division has shifted from uranium to precious metals, and to a lesser extent, base metals. The emphasis on gold exploration was accentuated in the latter months of 1982 by the reports in the press of significant new gold discoveries in the Hemlo area, Thunder Bay Mining Division, near the boundary with the Sault Ste. Marie Mining Division.

The number of claims recorded in the Sault Ste. Marie Mining Division from January 1 to November 25, 1982, is depicted graphically on Figure 2. The total claims recorded up to November 30, 1982, is 8982. Figure 3 of this report shows the significance of this increase in comparison to past years.

Most of this staking activity took place in the northern part of the Sault Ste. Marie Mining Division where, in October and November of 1982, almost all of the Crown Land on the Pukaskwa Metavolcanic-Metasedimentary Belt had been staked.

In November 1982, International Corona Resources Limited signed an agreement with the Algoma Central Railway for the mineral rights to 13½ townships in the Michipicoten Metavolcanic-Metasedimentary Belt. The townships involved in the agreement are outlined on Figure 1 of this report.

Even though the large increase in staking activity holds promise of a substantial increase in exploration expenditures in the Sault Ste. Marie Mining Division in 1983, it came too late to spur exploration in 1982.

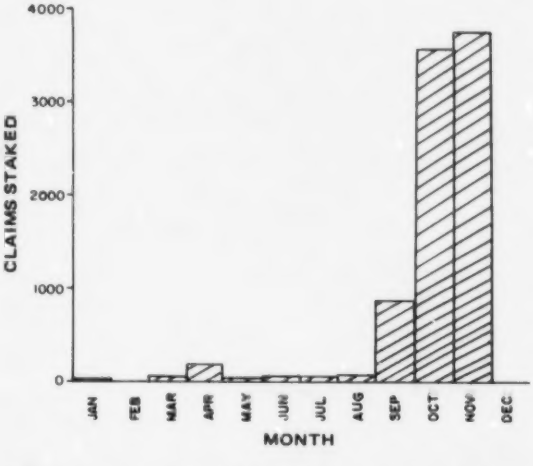

Figure 2 — Number of claims staked in the Sault Ste. Marie Mining Division from January, 1982 to November 25, 1982

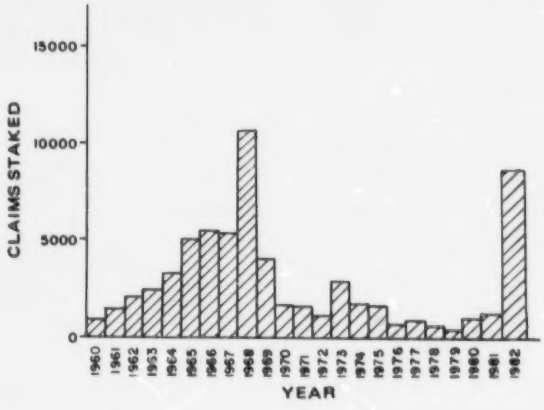

Figure 3 — Number of claims staked in the Sault Ste. Marie Mining Division from 1960 to November 25, 1982

Gold and Silver

Long Lac Mineral Exploration Limited staked a block of over 700 claims in Brothers, Laberge, and McCron Townships in 1981. Geological mapping, airborne magnetometer, electromagnetic, and spectrometer surveys were carried out over this ground in 1982. Much of Long Lac Mineral Exploration Limited's exploration efforts in 1982 were focused on diamond drilling a gold deposit on an adjacent group of claims in the Thunder Bay Mining Division. The success of the Long Lac Minerals diamond drilling program and that of other companies active in the Hemlo area is described in the Report of the Resident Geologist for the Thunder Bay Mining Division, in this volume.

The Magino Joint Venture (Cavendish Investing Limited and McNellen Resources Limited) continued work on their gold property formerly known as the Algoma Summit Mine and the Magino Mine in Finan Township. Eight thousand feet of underground diamond drilling was carried out in 1982. A surface drilling program is currently underway (December 1982).

The Magino Joint Venture also carried out geological mapping and geophysical surveys on an adjacent group of staked claims.

Dunraine Mines Limited carried out only limited surface work as part of their Parkhill Project in McMurray Township in 1982. However, Dunraine Mines Limited succeeded in uncovering a new mineralized shear zone at the surface which returned 0.126 ounce gold over 10 feet (Northern Miner, October 21, 1982).

TABLE 3 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

SAULT STE. MARIE MINING DIVISION

Abbreviations

A	-Airborne Survey	EM	-Electromagnetic Survey
AEM	-Airborne Electromagnetic Survey	G	-Ground Survey
AMag	-Airborne Magnetometer Survey	GL	-Geological Survey
Ag	-Silver	IP	-Induced Polarization Survey
Au	-Gold	Mag	-Magnetometer Survey
Co	-Cobalt	Pb	-Lead
Cu	-Copper	Rad	-Radiometric Survey
D	-Donated by Company or Individual	SA	-Sampling, Assays
DD	-Diamond Drilling	STr	-Stripping
DDH	-Diamond - Drill Hole	VLF	-Very Low Frequency

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Abotossaway	42C/2	Golden Algoma	Au	D	GL SA	1982 1959	-	Abotossaway 0022
Abotossaway	42C/2	Superior Acid and Iron, Ltd.	Fe	D	11 DDH(3296')	1968	-	Abotossaway 0015-1
Bailloquet	41N/15 42C/2	The Algoma Steel Corp. Ltd.	Cu,Pb,Zn, Au,Ag	Assess.	VLF	1981	2.4107	
Bruyere	42C/1 42C/8	Kingswood Exploration Ltd.		Assess.	GEM, GL, GMag	1982 1981	2.4472 2.4170	
Chabanel	42C/2	The Algoma Steel Corp. Ltd.	Cu,Pb,Zn	Assess.	VLF,GMag	1981	2.4141 2.4106 2.4008	
Debassige	42C/1	The Algoma Steel Corp. Ltd.	Cu,Pb,Zn	Assess.	VLF	1981	2.3951 2.3950 2.4007	Debassige 0012-B1
Esquega	42C/2	Regnery Metals	Mo	D	AS,GL	1958	-	Esquega 0019
Finan	42C/7 42C/8	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5019	
Glasgow & Meath	42C/8	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5022	
Gunterman	41J/7	R.A. MacGregor	U	Assess.	GRad, GL	1981	2.4350	
Hughes & Jollineau	41J/13	Canadian Nickel Co.		Assess.	AMag., ARad.	1982	2.5130	
Jacobson	42C/8	J.C. Potvin		Assess.	GEM, GMag	1982	2.4916 2.4915	
Jacobson	42C/8	Mattagami Lake Exploration Ltd.		Assess.	GEM, GMag	1982	2.5025 2.5021 2.5020	
Jacobson	42C/8	Vega Gold Exploration Inc.	Au	Assess.	GEM,GMag 4DDH(1264') AS	1982	2.4825	Jacobson 0038-A1
Jarvis	41K/9	Longbow Exploration	Au,Ag	Assess.	Plugger STr	1982	-	
Jarvis	41K/9	Paynter, Richard	Au,Ag	Assess.	STr	1982		
Laberge/Brother/ Bomby	42C/12	LongLac Mineral Exploration Ltd.		Assess.	AMag,AEM, ARad	1982	2.4857	
Leeson	42B/5	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5024	
Lendrum	41N/15 42C/2	The Algoma Steel Corp. Ltd.		Assess.	VLF	1980	2.3710	Lendrum 0011-A1
Lendrum	41N/15 42C/2	Herbert Funk	Au,Ag	Assess.	VLF,GL	1980	2.3632	
Lendrum & Bailloquet	41N/15 42C/2	The Algoma Steel Corp. Ltd.	Au,Ag,Cu, Pb,Zn	Assess.	VLF	1981	2.3788	
McMurray	41N/15	John S. Grant	Au	Assess.	GL	1982	2.4844	
McMurray	41N/15	Pango Gold Mines Ltd.	Au	Assess.	GMag, GRad	1982	2.4799	
McMurray	41N/15	VanSickle, L.A.	Au	Assess.	19DDH (4799.5') 40DDH (11014.8')	1981 1982		
Meath	42C/8	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5118 2.5023	

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Meath	42C/8	Teck Exploration Ltd.		Assess.	GEM,GMag	1982	2.4913 2.4495	
Molson Lake Area	42C/12	R.A. Schiralli		Assess.	GL	1982	2.5101	
Nicolet & Norberg	41N/1 41N/2	Dekalb	Cu	D	GL	1981		
Pilot Harbour Area	41N/13	Noranda Exploration Co. Ltd.		Assess.	GEM,GMag	1982	2.4599	
Poulin & Nicholas	41J/6	Utah Mines Ltd.		Assess.	GEM,GMag	1982	2.5111	
Rabazo	41N/15	The Algoma Steel Corp. Ltd.		Assess.	GEM,GMag	1982	2.5049 2.5048	
Rennie	42B/5	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5026	
Rennie	42B/5	Westfield Minerals Ltd.		Assess.	GEM,GMag	1982	2.4625	
Ryan	41N/2 41K/15	Phelps-Dodge Corp.	Au,Ag,Cu, Mo	D	DDH(965')	1966		Ryan 0015 Kincaid 0022
Ryan	41N/2 41K/15	Roy J. Rupert	Au,Ag,Cu, Mo,Wo_3	Assess.	GL SA	1982 1981	2.5037 2.4910 2.4231	
Stover	42B/5	Noranda Exploration Co. Ltd.		Assess.	GEM,GMag	1982	2.4919	
Stover & Blacklin	42B/5	Mattagami Lake Exploration Ltd.		Assess.	GEM,GMag	1982	2.5027	
Thessalon-Elliot Lake Area	41J/6 41J/7	Shell Mineral Resources	U	D	VLF,GL,SA, 1 DDH(1206 m)	1976-78	2.2182	Kamichisitit 0021 0035 Al

Gerald Longhurst, a Wawa prospector, acquired the Ranson Gold Deposit in Rabazo Township in 1982. During the summer of 1982, he began construction of a road to the property in order to facilitate further development.

In the Sault Ste. Marie area, Long Bow Explorations Limited did stripping and trenching south of Christman Lake in Jarvis Township. The company reported assays of up to 16.1 ounces silver per ton over 6 feet (Assessment Files, Ontario Ministry of Natural Resources, Sault Ste. Marie).

The Canadian Nickel Company (Inco Limited) carried out detailed geological mapping, electromagnetic, and magnetometer surveys over a lead-zinc-silver deposit in Hughes Township in 1982. A limited diamond drilling program was completed.

Westfield Minerals Limited continued surface work on their Mishibishu Lake Gold Property in 1982. Westfield Minerals Limited did geochemical sampling of humus and basal till, as well as additional rock trenching and sampling. The company plans to continue work on their property in 1983.

Base Metals

Noranda Exploration Limited and Mattagami Lake Exploration Limited tested a series of airborne and ground geophysical anomalies by limited diamond drilling programs in the Missinabie area during 1982.

Utah Mines Limited carried out geological mapping, electromagnetic, and induced potential surveys in Poulin Township.

Stratigraphic Relationship Between the Aweres and Thessalon Formations, Huronian Supergroup, in the Sault Ste. Marie Area

Introduction

The author (Bennett 1978, p.106) has stated that he was not aware of any evidence of the intercalation of the Thessalon Formation and the overlying formations. Since that statement was published, the author had the opportunity to guide experienced geologists to an area on the Algoma Central Railway line in the Bellevue area, Aweres Township, north of Sault Ste. Marie, where relationships between the basaltic flow of the Thessalon Formation and the clastic rocks of the overlying Aweres Formation can be seen. It was the opinion of some of these geologists that the relationships observed along the Algoma Central Railway tracks could be interpreted as an intercalation of the Aweres Formation and the Thessalon Formation, or that the relationships observed were at best ambiguous.

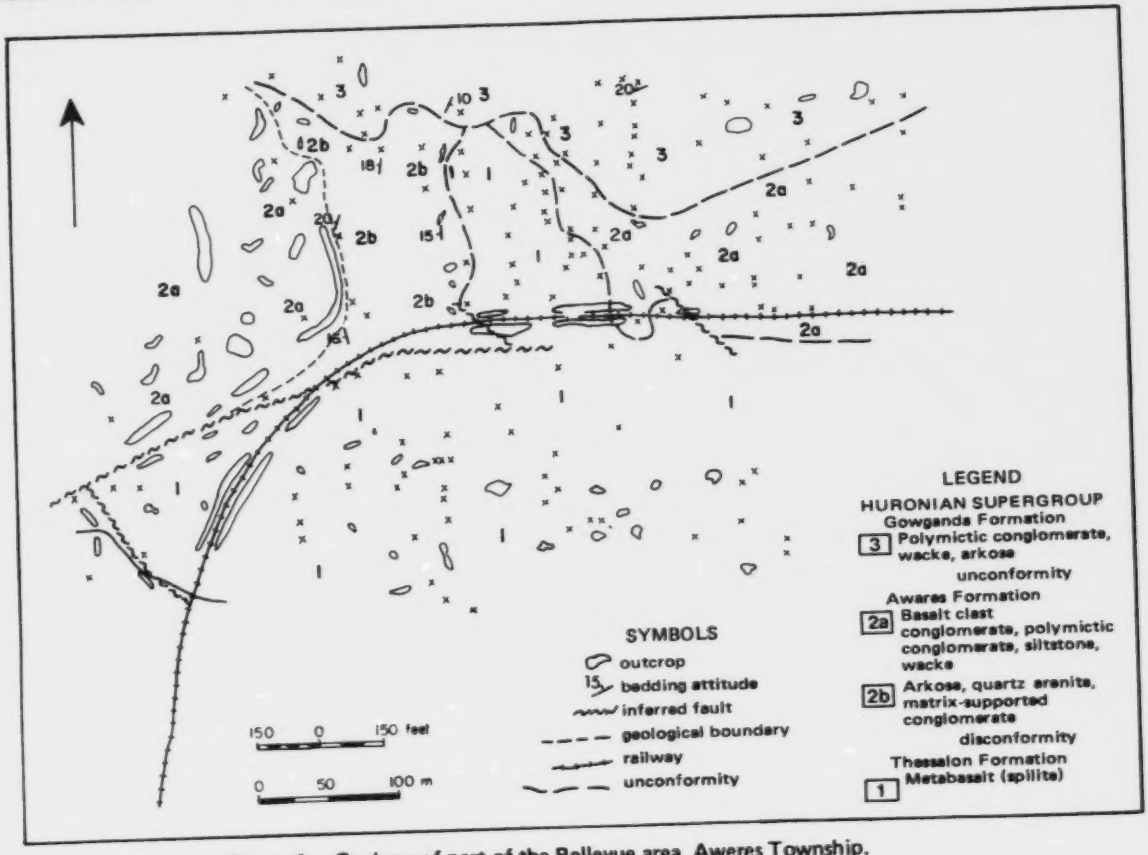

Figure 4 — Geology of part of the Bellevue area, Aweres Township.

Earlier workers in the area (Hay 1963, p.138, and Hay *in* Frarey 1977, p.24) had also concluded that these exposures indicated interbedding of the Aweres Formation and the Thessalon Formation.

When this author mapped the area in 1974, he also concluded that the formations were interbedded as stated by the earlier author. Ontario Division of Mines, Preliminary Map P.1064 (Bennett *et al.* 1975) indicated this relationship. However, subsequent mapping in Duncan Township led this author to conclude that the relationship observed was the result of conglomerate filling steep sided valleys on the rugged volcanic paleotopography.

Since it is important to remove any ambiguity regarding the relationship in question, it was decided to carry out detailed mapping of the area during the summer of 1982.

Lines were run north-south from the railway track at 80-foot intervals and flagged every 100 feet. The area is covered by open maple growth and there was no need to cut or blaze lines. The accuracy obtained was sufficient for the purpose.

General Geology

The Thessalon Formation forms part of the Elliot Lake Group, the lowermost group of the Huronian Supergroup. In the Sault Ste. Marie area, the Thessalon Formation is composed mainly of mafic volcanic flows with minor intercalations of arkose and radioactive quartz-pebble conglomerate near the base of the sequence. Chemical analyses have indicated the presence of a lower member of basaltic andesite with alkalic affinities, and an upper member of tholeiitic basalt (Unpublished analyses by the Geoscience Laboratories, Ontario Geological Survey, Toronto).

In most areas, the volcanic rocks of the Thessalon Formation contain a greenschist facies mineral assemblage consisting of actinolite, albite, leucoxene, chlorite, and epidote group minerals. However, in the Bellevue area, some of the original clinopyroxene remains in a relatively unaltered state.

The Aweres Formation is a thick sequence of clastic rocks overlying the Thessalon Formation along a strike length of about 13 km. The basal unit of the

Aweres Formation is predominantly composed of volcanic (Thessalon Formation) megaclasts and Early Precambrian granitic clasts in an arkose matrix. The proportion of granitic to volcanic megaclasts in the conglomerates increases irregularly with increasing stratigraphic height. The proportion of arkose to conglomerate also increases with stratigraphic height (Bennett *et al.* 1975).

Within the area of Figure 4, the Thessalon Formation consists of dark grey-green spilitic basalt. Locally, flows are glomeroporphyritic. Black chlorite-filled amygdules are almost ubiquitous. Amygdules filled with quartz, calcite, epidote, and red albite are locally present. Interflow breccias are commonly cemented by quartz and albite.

Three main rock types can be identified in the Aweres Formation of Figure 4. A clast-supported conglomerate containing more than 90% mafic volcanic clasts of cobble and pebble size is in almost vertical contact with Thessalon Formation basalt along the railway track. The conglomerate extends along the eastern side of the northward-trending tongue of the Thessalon Formation shown in Figure 4. The matrix of this conglomerate is chloritic sandstone. There are no discernable primary structures in this unit.

On the western side of the Thessalon Formation tongue, there is a unit of poorly sorted, grey, coarse-grained arkose assigned to the Aweres Formation. There is a thin matrix-supported conglomeratic unit at the base of the arkose, and a thin quartz arenite unit is locally present at the top. The overall thickness of the arkose unit is about 23 m. Locally, trough cross-bedding can be discerned in the arkose. Well-defined planar beds occur near the top of the unit. The arkose unit dips between 10° and 20° W.

Overlying the arkose is a thick unit of clast-supported and matrix-supported polymictic conglomerate typical of the Aweres Formation of the area. The clasts consist mainly of varying proportions of mafic (Thessalon Formation) volcanic and granitic types. The matrix is poorly sorted coarse-grained arkose.

A thin unit of laminated wacke and siltstone occurs within the basalt clast conglomerate where it is exposed on the rock-cut along the railway track. The contacts between the conglomerate and the wacke are almost vertical, yet bedding in the wacke, although contorted, has in general a much shallower dip. This rock type was not observed anywhere else in the area.

Conclusions

Rock exposures along the railway track show the contact between the Thessalon Formation and the Aweres Formation to be almost vertical, yet bedding attitudes in the Aweres Formation itself only 100 m distant shows that the dip of the formation is <20°. These considerations and the general distribution of the formations as shown on Figure 4 clearly indicate that the Aweres Formation unconformably overlies the Thessalon Formation and is not interbedded with it. This conclusion is further supported by the presence of abundant clasts of Thessalon Formation basalt in the Aweres conglomerates.

The relationships between the Thessalon Formation and the Aweres Formation observed along the Algoma Central Railway track is the result of the deposition of the Aweres Formation against steeply dipping faces of Thessalon Formation basalt.

Gold in Radioactive Quartz-Pebble Conglomerates of the Thessalon Area, District of Algoma

Radioactive quartz-pebble conglomerates are found near or at the base of the dominantly volcanic Thessalon Formation, Huronian Supergroup, between Sault Ste. Marie and the northeastern part of the Quirke Lake Syncline. The conglomerates and associated arkose beds are generally <1 m thick and are discontinuous along strike. These rocks represent fluviatile sands and gravels deposited in a graben or basin formed as a response to initial volcanism. Continuing volcanism resulted in filling of the depression by lava flows, precluding further sedimentation (Bennett 1976).

Forty-two samples were collected by the author from these conglomerate and arkose beds in the Thessalon area in the fall of 1982. To date (December 1982) the results of only 6 analyses are available. Four of these samples were taken from the quartz-pebble conglomerates of the Thessalon Formation where it directly overlies an erosion surface on the Livingstone Creek Formation sandstone.

Two samples from an island in Lake Huron contain 600 parts per billion and 200 parts per billion gold. Two samples from the same stratigraphic position on Cullis Lake in Day Township returned 4300 and 320 parts per billion gold. The maximum uranium and thorium content is 100 parts per million (0.2 pound per ton).

The occurrence on Cullis Lake is in a block <200 m wide, bounded by major faults.

Two samples from the Matinenda Formation, which overlies the Thessalon Formation volcanic rocks, contain 7 and 9 parts per billion gold. This is believed to be in the range of the background gold content for sandstones of the area.

The occurrences reported here are on private land and appear to have very limited exploration potential, but they do suggest that gold has been concentrated in Huronian conglomerates, presumably by a placer mechanism.

Further work to test the gold potential of the Lower Huronian, Thessalon Formation conglomerates, is planned for 1983.

Ontario Geological Survey Activities

R.P. Sage carried out geological mapping at a base map scale of 1:15 840 or 1 inch to ¼ mile in the Josephine area, District of Algoma. The townships mapped during the 1982 field season were Corbiere and parts of Leclaire, Abotossaway, Aguonie, and Bird.

E.C. Grunsky continued the Batchawana Synoptic Project in 1982. Reconnaissance and detailed mapping were carried out in previously unmapped areas to resolve discrepancies between existing geological maps.

N.W.D. Massey carried out geological mapping in the Mishewawa Lake area south of the Town of Wawa. Most of Rabazo and Naveau Townships were mapped at a scale of 1:15 840 or 1 inch to ¼ mile in 1982.

D.J. Russell carried out detailed mapping and geological investigations of the Paleozoic geology along the eastern shore of Lake Superior and the western part of Lake Huron.

The preliminary results of the above studies are published in the Summary of Field Work, 1982, by the Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Suggestions to Prospectors

The recent developments in the Hemlo area have led to an expansion of the criteria which apply in the search for favourable areas for gold deposits. In the Hemlo area, gold seems to occur at a well-defined stratigraphic position, within a sequence of highly metamorphosed, volcaniclastic sedimentary rocks (*see* 1982 Report of the Thunder Bay Resident Geologist, this volume). The minerals associated with the gold are pyrite, molybdenite, and a green mica (reported to be barium rich). An obvious structural control is lacking, as are gold-bearing quartz veins and carbonate alteration.

Individual prospectors would do well to pay particular attention to pyritic metasediments regardless of the metamorphic grade. Molybdenite and green mica are, of course, additional useful indicators, but it should not be assumed that other gold deposits of the Hemlo type will have the same mineral assemblage.

Analysis for gold to the parts per billion level may prove a useful prospecting method to identify relatively thick rock units of above background gold content, within which richer units may exist.

The recognition of the Hemlo gold deposits as a new, previously unrecognized association, leads to the question; "How many similar deposits have been overlooked because of their lack of associated veins and relatively inconspicuous appearance?". Prospectors would do well to look again at previously explored "greenstone belts" such as the Batchawana and the Goulais River Belts north of Sault Ste. Marie for stratabound gold deposits. Smaller, unnamed areas of metavolcanics and metasediments, shown on the 1:253 440 or 1 inch to 4 mile scale geological compilation series maps of the Ontario Geological Survey, may bear examination. The high metamorphic grade expected in these belts is no longer a negative factor in terms of their exploration potential for gold.

The presence of anomalous gold concentrations in conglomerates of the Thessalon Formation is significant in that it suggests the concentration of gold by a placer mechanism. These quartz-pebble conglomerates of the Thessalon Formation are well defined stratigraphically, occurring at or near the base of the formation; however, they are generally <1 m thick and discontinuous along strike.

It should be borne in mind that no mineable gold deposits, or even significant prospects, have yet been found in Huronian quartz-pebble conglomerates. The presence of gold in the amounts indicated in this report suggests that some potential exists for Huronian placer gold deposits; however, the magnitude of this potential cannot be determined from the few analyses available so far.

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1982a: Goulais River Area, District of Algoma; p.44-47 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

1982b: Ile Parisienne and Rudderhead Points Area, District of Algoma; p.41-43 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Karrow, P.F.
1982: Quaternary Geology of St. Joseph Island, District of Algoma; p.123-124 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Massey, N.W.D.
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McMillan, Doug
1982: The Significance of Chloritoid Within the Footwall Volcanic Rocks of the Helen Iron Range, Wawa, Ontario; Unpublished B.Sc. Thesis, University of Western Ontario, 56p.

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1982: Contaminant Migration in a Sand Aquifer Near an Inactive Uranium Tailing Impoundment, Elliot Lake, Ontario; Canadian Geotechnical Journal, Volume 19, p.49-62.

Robinson, A.G.
1982: The Origin and Modification of a Uraninite Bearing Placer, Elliot Lake, Ontario; Unpublished M.Sc. Thesis, University of Toronto, 214p.

Ross, David Ian
1982: The Distribution of Gold and Other Elements in the Uranium Conglomerate of Elliot Lake, Ontario; Unpublished M.Sc. Thesis, McMaster University, 101p.

Russell, D.J.
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Sage, R.P.
1982a: Josephine Area, District of Algoma; p.23-33 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

1982b: Preliminary Appraisal of Alteration of Metavolcanics in the Wawa Area, District of Algoma; p.34-35 *in* Summary of Field Work, 1982, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Skrecky, Gordon
1982: A Petrological and Geochemical Study of a Precambrian Vein-Type Molybdenite Occurrence Near Wawa, Ontario; Unpublished M.Sc. Thesis, Laurentian University, 71p.

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1975: Jarvis Lake-Garden River Area, District of Algoma; Ontario Division of Mines, Preliminary Map P.1064, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1974.

Frarey, M.J.
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Hay, R.E.
1963: The Geology of the Sault Ste. Marie Map-Area; Unpublished Ph.D. Thesis, McGill University, Montreal, 325p.

1982 Report of the Sudbury Resident Geologist

P.E. Giblin[1], and J.M. Martins[2]

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Introduction

The Sudbury office is staffed by: R. Adlington, Resource Geologist; P.E. Giblin, Resident Geologist; J.M. Martins, Resource Geologist; Y.M. Paquette, Secretary; and J.C. Wilson, Regional Mineral Resources Coordinator.

Exploration activity in the area was directed principally towards gold deposits. It showed a marked decline from the previous year's level of activity.

Mining activity also declined sharply. The operations of both Inco Limited and Falconbridge Limited were shut down from June through to the end of the year (*see* Figure 3).

Resident Geologist's Activities

R. Adlington continued compilation of data series maps, 51 of which were published during the year. Late in the year, this map series was discontinued and a new format, known as the Geological Data Inventory Folio, was adopted. Eleven of the folios were completed, of which 1 had been published in 1982. These maps and folios, which summarize exploration data on a township basis, are presently available for a major part of the Sudbury Resident Geologist's District.

The following staff members worked in co-operation with the Precambrian Section of the Ontario Geological Survey. J.M. Martins mapped Blezard Township at a scale of 1:15 840 (1 inch to ¼ mile). P.E. Giblin completed field work in the Goulais River, Ile Parisienne, and Rudderhead Point areas near Sault Ste. Marie, and also commenced mapping Garson Township in the Sudbury area at a scale of 1:15 840.

The authors also visited mines, exploration projects, and examined numerous mineral occurrences. The staff responded to many requests for information from industry, government agencies, and the public, participated in land-use planning projects, and led field trips for industry, university, and government groups.

Mining Activity

Mining activity in the area is dominated by the production of nickel, copper, and precious metals from the Sudbury operations of Inco Limited and Falconbridge Limited. Other commodities produced from the district include uranium, silica, dolomite, sand, and gravel.

Nickel-Copper-Precious Metals

The declines in market demand and price for nickel resulted in a major curtailment of operations for both producers.

Immediately following settlement of a month-long strike in June, Inco Limited shut down its operations. The company has announced that production will be resumed in April 1983. Falconbridge Limited suspended operations near the end of June, has remained closed since then, and has announced plans to resume production in January 1983.

During the first half of the year, Inco Limited produced ore from the Coleman Mine until March, when the mine was closed, and from the Copper Cliff South, Creighton, Frood, Garson, Levack, Little Stobie, McCreedy West, and Stobie Mines. During the same period, Falconbridge Limited produced ore from the East, Falconbridge, Fraser, Lockerby, North, Onaping, and Strathcona Mines.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Sudbury.
[2]Resource Geologist, Ontario Ministry of Natural Resources, Sudbury.

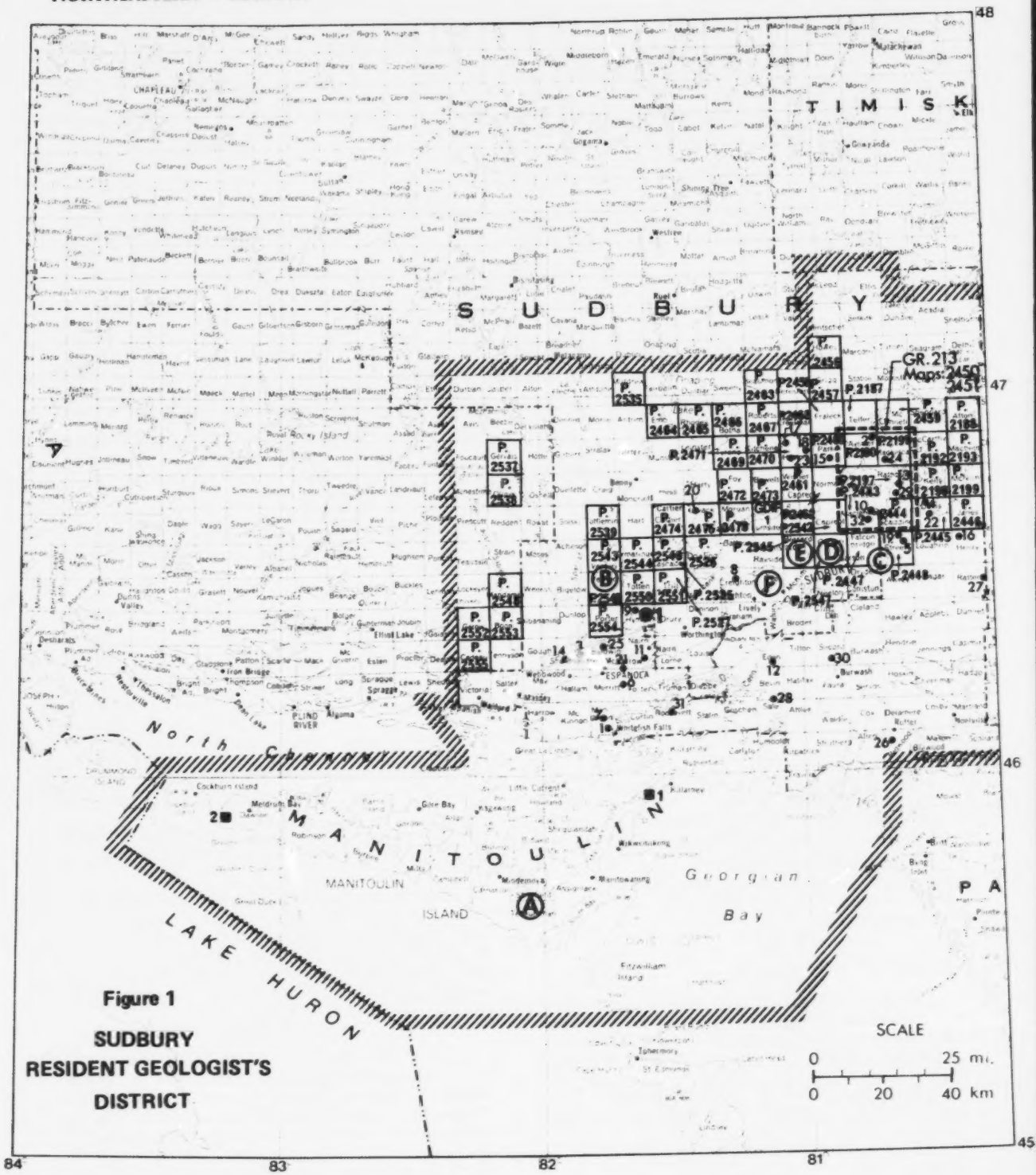


Figure 1

SUDBURY RESIDENT GEOLOGIST'S DISTRICT

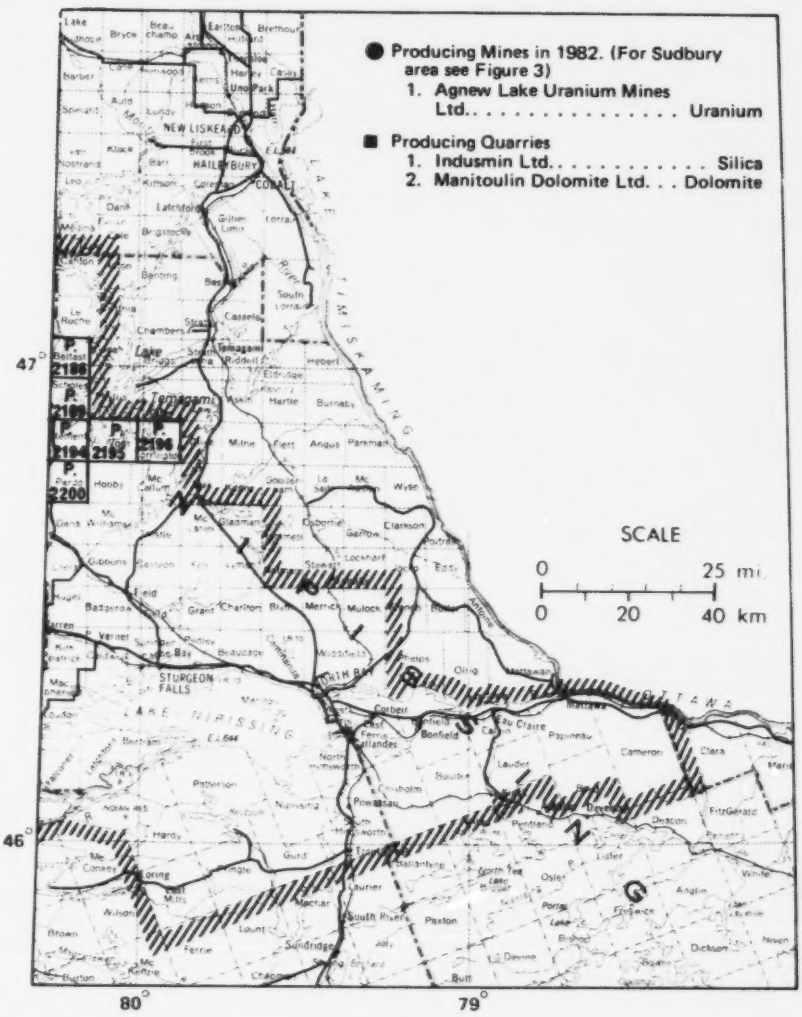
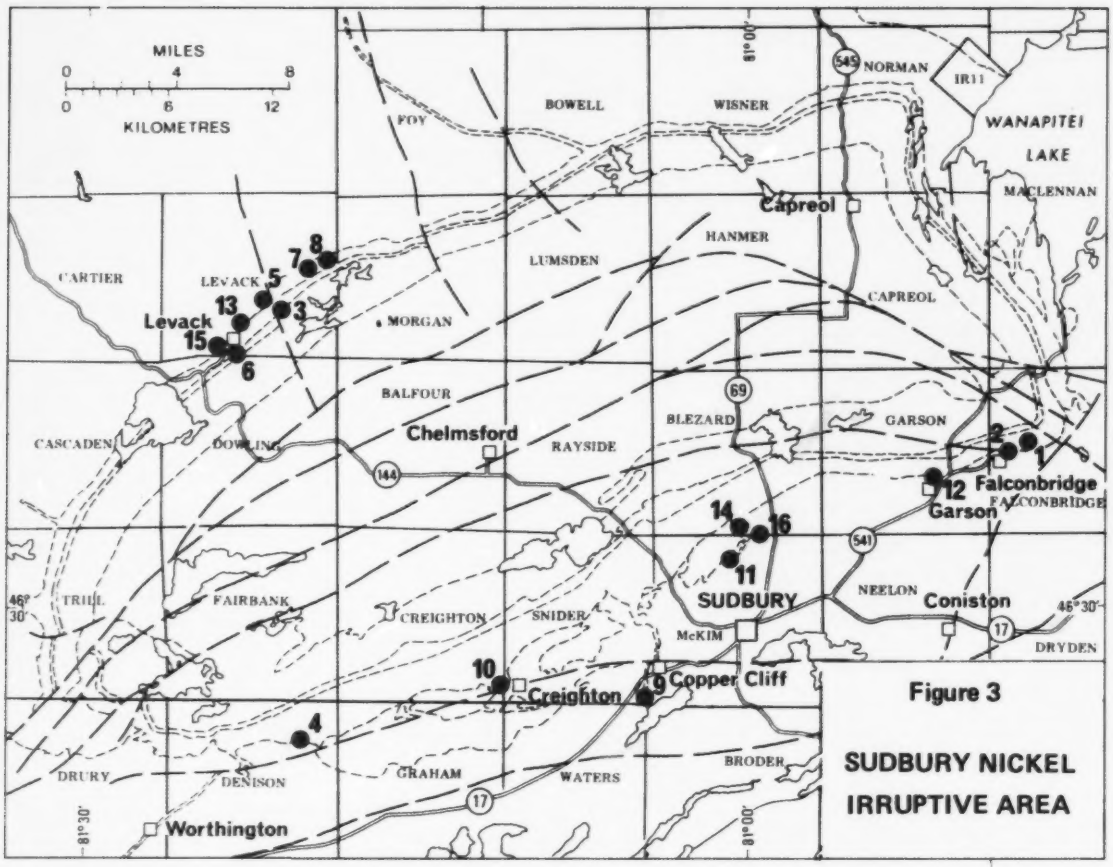

EXPLANATION
Exploration activity in 1982 (Keyed to table 2)
Location of OGS field party in 1982
Boundary of Resident Geologist's district.
Map or report issued by the Ontario Geological Survey. (Keyed to table 1)
P. — Preliminary Map
2450 — Coloured Map
GR. — Ontario Geological Survey Report
GDIF — Geological Data Inventory Folio Map
Producing Mines in 1982. (For Sudbury area see Figure 3)
1. Agnew Lake Uranium Mines Ltd. . . . . Uranium
Producing Quarries
1. Indusmin Ltd. . . . . Silica
2. Manitoulin Dolomite Ltd. . . Dolomite
SCALE
0 25 mi
0 20 40 km
47°
46°
80°
79°
NEW LISKEARD
HAILEYBURY
COBALT
STURGEON FALLS
LAKE NIPISSING
FRENCH R.
MATTAWA
OTTAWA R.

Figure 2
SUDBURY RESIDENT GEOLOGIST'S DISTRICT



EXPLANATION

● Producing Mines

Falconbridge Ltd. . . . . Ni, Cu, Pt, Co, Au, Ag

1. East Mine
2. Falconbridge Mine
3. Fraser Mine
4. Lockerby Mine
5. North Mine
6. Onaping Mine
7. Strathcona Mine

Inco Ltd. . . . Ni, Cu, Pt, Se, Te, Co, Au, Ag, Fe

8. Coleman Mine
9. Copper Cliff South Mine
10. Creighton Mine
11. Frood Mine
12. Garson Mine
13. Levack Mine
14. Little Stobie Mine
15. McCreedy West Mine
16. Stobie Mine

Uranium

Agnew Lake Mines Limited continued production of uranium oxide on a salvage leach basis. Late in the year, the company announced that operations would be suspended within a few months.

Industrial Minerals

Indusmin Limited continued production of silica from the company's quarry on Badgeley Island in Georgian Bay.

Manitoulin Dolomite Limited continued production of dolomite from a quarry located at the western end of Manitoulin Island.

Sand and gravel were produced from numerous pits. These pits are concentrated particularly in the Sudbury and North Bay areas.

Ontario Geological Survey Activities

Publications published by the Ontario Geological Survey that pertain to this area are listed in Table 1.

The Engineering and Terrain Geology Section of the Ontario Geological Survey drilled 3 holes on Manitoulin Island as part of a program to evaluate the oil shale potential of the province (A, Figure 1).

Projects, listed below, were carried out by staff of the Precambrian Geology Section of the Ontario Geological Survey. Several projects were carried out by the staff of the Sudbury Resident Geologist's Office in co-operation with the Precambrian Geology Section of the Ontario Geological Survey.

A.G. Choudhry carried out mapping in the Macaulay Lake area at a scale of 1:15 840 (B, Figure 1).

B.O. Dressler continued a detailed study of the sublayer and footwall of the Sudbury Igneous Complex (formerly termed Sudbury Nickel Irruptive), concentrating on the south-central and southeastern parts of the Sudbury mining area (C, Figure 1). In addition, Dressler completed a new compilation map of the Sudbury area at a scale of 1:50 000.

P.E. Giblin commenced mapping of Garson Township at a scale of 1:15 840 (D, Figure 1).

J.M. Martins mapped Blezard Township at a scale of 1:15 840 (E, Figure 1).

T.L. Muir carried out a study of the Onaping Formation in the Sudbury area (F, Figure 1).

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

GR 213

Open File Reports

OFR 5327
OFR 5328
OFR 5371
OFR 5380

Preliminary Maps - Geological Series

P.2426
P.2525
P.2526
P.2527

Preliminary Maps - Data Series

P.2186	P.2193	P.2199	P.2459	P.2464	P.2469
P.2187	P.2194	P.2200	P.2460	P.2465	P.2470
P.2188	P.2195	P.2456	P.2461	P.2466	P.2471
P.2189	P.2196	P.2457	P.2462	P.2467	P.2472
P.2192	P.2198	P.2458	P.2463	P.2468	P.2473

Aggregate Resources Publications

Federal - Provincial Maps

G.S.C. Map 12-1982
G.S.C. Map 1335A

Coloured Maps

2450
2451

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

MP 77	MP 103
MP 101	MP 106

Geological Survey of Canada Open File Reports

OFR 863

Exploration Activities

The general level of exploration activity showed a marked decline compared with the level of activity in 1981 (Tables 2 and 3).

A total of 616 new mining claims were recorded during the first 11 months of the year, a sharp drop from the total of 2973 claims recorded during the comparable period of 1981.

Most exploration work was centred on the search for, and evaluation of gold deposits associated with rocks of the Huronian Supergroup, principally in the Lake Wanapitei and Espanola areas.

In the Lake Wanapitei area, stripping and trenching were carried out by J. Brady in Davis Township, Cowaching Mines Limited in Maclennan Township, O.

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2 EXPLORATION ACTIVITY IN 1982

The following is a list of companies and individuals known to have conducted exploration work within the Sudbury Resident Geologist's district in 1982, exclusive of exploration work for nickel deposits related to the Sudbury Igneous Complex. Previously unreported work from 1981 is included. The numbers correspond to the numbered areas on Figures 1 and 2.

Number on Figure	Individual or Company	Activity
1	Ascona Petroleum Ltd.	Drilling, gold prospect, Mongowin Township
2	Ateba Mines Inc.	Magnetometer, VLF, EM surveys, Telfer Township, Scadding, McConnell and Aylmer Townships, 1981
3	Blue, P.	Trenching, gold prospect, Shakespeare Township
4	Brady, J.	Magnetometer, EM surveys, stripping, gold prospect, Davis Township
5	Canadian Nickel Company Ltd.	Airborne EM, magnetometer, radiometric surveys, Maclennan, Street, Falconbridge, Rathbun Townships, 1981
6	Canadian Nickel Company Ltd.	Geological survey 1981, magnetometer survey 1981-82, Merritt and Foster Townships
7	Canadian Nickel Company Ltd.	Drilling, gold prospect, Mongowin Township
8.	Cieszynski, H.	Trenching, sampling, gold prospect, Creighton Township, 1981
9	Cominco Ltd.	Drilling, gold prospect, Hyman Township
10	Cowaching Mines Ltd.	Trenching, gold prospect, Maclennan Township
11	Crick, E.	Trenching, Nairn Township
12	Du Pont of Canada Exploration Ltd.	Geological and geophysical surveys, 1981-82; drilling 1982, gold prospect, Eden Township
13	Floron Mining Enterprises Ltd.	Stripping, trenching, nickel-copper-platinum prospect, Rathbun Township
14	Galbraith, J.	Drilling, gold prospect, Shakespeare Township
15	Karvinen, W. O.	Geological surveys, Parkin and Scadding Townships, 1981
16	Leblanc, A.	Trenching, Henry Township
17	Long Lac Mineral Exploration Ltd	Airborne EM and magnetometer surveys, Hutton Township
18	Maki, O. T.	Trenching, gold prospect, Hutton Township
19	McLean, P. C.	Geological survey, Street Township
20	Northgate Explorations Ltd.	Magnetometer and VLF surveys, Levack Township
21	Owen, J. P.	Stripping, trenching, copper-nickel prospect, Baldwin and Nairn Townships
22	Plexman, E. J.	Trenching, sampling, gold prospect, Davis Township
23	Roy, A.	Trenching, Hutton Township
24	Sheppard, T.	EM survey, Mackelcan and Aylmer Townships
25	Springer, C.	Drilling, uranium prospect, Baldwin Township
26	Steep Rock Iron Mines Ltd.	Drilling, nepheline syenite prospect, Bigwood Township
27	Steep Rock Iron Mines Ltd.	Drilling, feldspar prospects, Ratter and Hugel Townships
28	Sulpetro Minerals Ltd.	EM and magnetometer surveys, Bevin and Sales Townships
29	Viitala, R.	Trenching, sampling, gold prospect, Rathbun Township
30	Warren Industrial Feldspar Company Ltd.	Bulk sampling, silica prospect, Secord Township
31.	White, L. S.	Stripping, Roosevelt Township
32	Winterbourne Explorations Ltd.	EM and magnetometer surveys, Maclennan Township

TABLE 3

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

SUDBURY REGION

AEM - Airborne Electromagnetic Survey
Assess - Assessment Work
BM - Base Metal
BS - Beneficiation Studies
CS - Core Samples
DDH - Diamond - Drill Hole
EM - Electromagnetic Survey
Geochem - Geochemical Survey
GL - Geological Survey
IP - Induced Polarization Survey
Mag - Magnetometer Survey
Rad - Radiometric Survey
SA - Sampling, Assays
Tr - Trenching
VLF - Vertical Low Frequency

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Aylmer	41 I/15	Canadian Nickel Company Limited		Assess	GL,SA	1981		
Aylmer & Mackelcan	41 I/15	Corner Bay Explorations Limited	Au	Assess	A EM,A Mag	1981		
Baldwin	41 I/5	Owen, James P.	Cu,Ni	Assess	Tr	1982		
	41 I/5	Springer, Conrad	U	Assess	DDH 5-1158'	1982		
Bigwood	41 I/2	Steep Iron Rock Mines Limited	Neph	Assess	DDH 6-705'	1982		
Creighton	41 I/11	Cieszynski, Henry	Au	Assess	Tr,SA	1981	2.4643	
Curtin	41 I/4	Dungarvon Resources	Au	Assess	EM,Mag	1980	2.3725	
Davis	41 I/10	Brady, John	Au,Ag	Assess	Tr	1981		
	41 I/10	Plexman, Eric J.	Au,Ag	Assess	SA,Tr	1981, 1982		
	41 I/10	Silverside Resources Inc.	Au	Assess	EM,Mag	1981	2.4353	
	41 I/10	Tomasini, Michael	Au	Assess	Tr	1981		
	41 I/10	Ultimate Energy & Resources Inc.	Au	Assess	EM,Mag,Tr	1981	2.4357	
Drury	41 I/6	Inco Limited		Assess	DDH 1-802'	1981		
Eden	41 I/6	Dupont of Canada Exploration Limited	Au	Assess	GL,Mag, DDH 3-1000'	1981 1982	2.4554, 2.4555, 2.4556	
	41 I/6	Luke Lake Limited	Au	Assess	EM,Mag	1981	2.4061	
Foster	41 I/4	Sulpetro Minerals Limited	W,Mo	Assess	SSH 3-21,180'	1981		
Fraleck	41 I/15	Larson, Rudolf	Au	Assess	Tr	1981		
Harrow	41 J/1	Teledyne Canada Limited	Co	Assess	Tr,DDH 6-626',CS	1981		
Henry	41 I/9	Leblanc, Albert		Assess	Tr	1982		
Hess	41 I/12	Cominco Limited		Assess	EM,Mag,IP	1981	2.4005	
Hutton	41 I/14	Kerr Addison Mines Limited	Au	Assess	EM	1981	2.3946 2.4130	
	41 I/14	Maki, Oliver T.	Au	Assess	Tr,SA	1982		
	41 I/14	Roy, Art	Au	Assess	Tr	1982		
Hyman	41 I/5	Cominco Limited	Au	Assess	DDH 3-441'	1982		
	41 I/5	Tamminen, Taisto	Au,Ag,Cr,Ni	Assess	Geochem,GL	1981	2.4147	
Levack	41 I/11	Falconbridge Limited	Ni,Cu	Assess	DDH 1-608'	1981		
Mackelcan, McConnell	41 I/15	Dejour Mines Limited	Au	Assess	A EM,A Mag,VLF	1981		
Mackelcan, Rathbun	41 I/15	Flag Oils Limited	Au	Assess	EM,VLF,Mag,IP DDH 23-9,207.6'	1981	2.4062	

TABLE 3 Continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Fi...
Maclennan	41 I/10	Sheppard, Thomas	Au	Assess	GL,TR,EM,SA	1981, 1982		
Maclennan, Street, Falconbridge	41 I/10	Canadian Nickel Company Limited		Assess	A EM,A Mag,Rad	1981		
McKinnon	41 I/4	Cuomo, Ken	Au,Ag	Assess	GL	1981		
Merritt, Foster	41 I/4	Canadian Nickel Company Limited	Au	Assess	GL	1981	2.4532	
Mongowin	41/4	Ascona Petroleum Limited	Au	Assess	DDH 4-260.15'	1982		
	41 I/4	Canadian Nickel Company Limited	Au	Assess	GL,DDH 3-1166'	1981, 1982	2.4268	
Morgan	41 I/11	Falconbridge Limited	Ni,Cu	Assess	GL	1982		
Nairn	41 I/5	Crick, Edward		Assess	Tr	1982		
	41 I/5	Owen, James	Cu,Ni	Assess	Tr	1982		
Parkin	41 I/15	Huston, Carl D.	Au	Assess	Tr,BS,GL	1981		
	41 I/15	Karvinen, W. O.	Au	Assess	GL	1981	2.4536	
	41 I/15	Kerr Addison Mines	Au	Assess	EM	1981	2.4129	
Porter	41 I/5	Tamminen, Taisto	Ag,Au, Pb,Cu	Assess	SA	1980		
Rathbun	41 I/15	Floron Mining Enterprises Limited		Assess	Tr	1982		
	41 I/15	Canadian Nickel Company Limited		Assess	A EM,A Mag,Rad	1981		
	41 I/15	Viitala, Reino L.	Au	Assess	EM,Tr,Geochem,SA	1981, 1982		
Rhodes	41 I/14	Hudbay Mining Limited	BS,Au	Assess	DDH 2-83.18', CS,A EM	1981	2.3934	
Roberts	41 I/14	Karvinen, W. O.	Au	Assess	DDH 2-475',BS	1981, 1982		
Roosevelt	41 I/4	White, L. S. & White, J.	Au	Assess	Tr	1982		
	41 I/4	Dungarvon Resources Limited	Au	Assess	EM,Mag	1981	2.4085	
Scadding, Davis	41 I/10	Ateba Mines Inc.	Au	Assess	EM,Mag,VLF	1981		
	41 I/10	Butler, R. C. & Laaksonen, A.	Au	Assess	Tr	1981		
	41 I/10	Kangoriak Resource Corp.	Au	Assess	EM,Mag	1981	2.4359 2.4360	
	41 I/10	Karvinen, W. O.	Au	Assess	GL	1981	2.4563	
	41 I/10	Scadding Gold Mines Limited	Au	Assess	Orthophoto-grammetric	1981	2.4121	
Shakespeare	41 I/5	Galbraith, John	Au	Assess	DDH 1-114'	1982		
	41 I/5	Blue, Peter	Au,Cu	Assess	SA,Tr	1981, 1982	2.4132	
	41 I/5	Highland-Crow Resources Limited	Au	Assess	GL	1981	2.4505	
Telfer, Aylmer, Mackelcan, McConnell	41 I/15	Ateba Mines Inc.	Au	Assess	EM,Mag	1981	2.4234	
Telfer, McConnell, Sheppard, Clary, Stobie, Demorest	41/15	Canadian Nickel Company Limited	U_3O_8	Assess	GL,SA	1981		
Vernon, Porter	41 I/12	Tamminen, Taisto	Au,Ag	Assess	SA	1981		

Maki in Hutton Township, E. Plexman in Davis Township, and by R. Viitala in Rathbun Township. Geophysical surveys were also carried out by J. Brady and by Winterbourne Explorations Limited in Maclennan Township.

Small-scale diamond-drill programs were carried out on gold deposits in the Espanola area by Ascona Petroleum Limited and by the Canadian Nickel Company Limited in Mongowin Township, and by Cominco Limited in Hyman Township.

In the Sudbury area, Du Pont of Canada Exploration Limited carried out diamond drilling in the vicinity of the former Long Lake Mine located in Eden Township.

Exploration for nickel deposits associated with the Sudbury Igneous Complex was continued near Sudbury by Falconbridge Limited and Inco Limited. Copper-nickel deposits associated with Nipissing Diabase Intrusions were investigated in the Espanola area by J. Owen, and in the Lake Wanapitei area by Floron Mining Enterprises Limited.

Industrial mineral deposits in rocks of the Grenville Province received considerable attention. Steep Rock Iron Mines Limited carried out diamond drilling programs on a nepheline syenite body in Bigwood Township, and on feldspar deposits located in Ratter and Hugel Townships. Warren Industrial Feldspar Company Limited carried out bulk sampling of a silica deposit in Secord Township.

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Pearson, W.N.
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1981c: Diamictites of the Early Proterozoic Ramsay Lake and Bruce Formations, North Shore of Lake Huron, Ontario, Canada; p.813-815 *in* Earth's Pre-Pleistocene Glacial Record, Edited by M.J. Hambrey and W.B. Harland, Cambridge University Press.

1982 Report of the Huntsville Resident Geologist

David J. Villard[1]

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Introduction

The Algonquin Region, for Mineral Management purposes, is divided into 2 areas of responsibility (Figure 1). The Huntsville Resident Geologist is responsible for the northwestern half of the region as is shown on Figure 1.

Presently, staff in the Huntsville office include: William J. Logan, Mineral Resources Coordinator; David J. Villard, Resident Geologist; and Martha Fabricius, Secretary. Contract staff include Jill Van Luit, who is currently carrying out an aggregate assessment of the Muskoka area, and Wendy Martin, who left part way through the year, after completing an industrial mineral inventory of the Algonquin Region. Two regular program students and 2 Experience '82 students were employed during the summer to work on various projects.

The number of claims recorded decreased significantly from 1981, but the level of exploration activity increased. This was due mainly to the interest in flake graphite, with exploration programs being initiated on several properties.

Exploration for gold was minimal, although some interesting results were obtained in 1982. The Huntsville office may publish the initial results of its inventory of gold occurrences.

Resident Geologist's Activities

Even though the amount of exploration activity was not high, a fair amount of the Resident Geologist's time was spent on consultative duties. Industrial minerals (mainly graphite), base metals, and gold were the main commodities for which information was requested. Emphasis was again placed on familiarization with the geology and the active mineral properties in the area.

Several field trips and tours were attended by the author; 2 of the more beneficial were a tour of the graphite occurrences southwest of Mont Laurier, Quebec, and a tour of the Montauban Gold Deposit west of Quebec City.

A one day Prospectors' Class was given jointly by: Hans D. Meyn, Resident Geologist in Bancroft; R. Keevil, acting Lands and Minerals Specialist at the Frost Centre; and D. Villard, Resident Geologist in Huntsville. Twenty-six people attended. It is hoped to hold more classes in the near future.

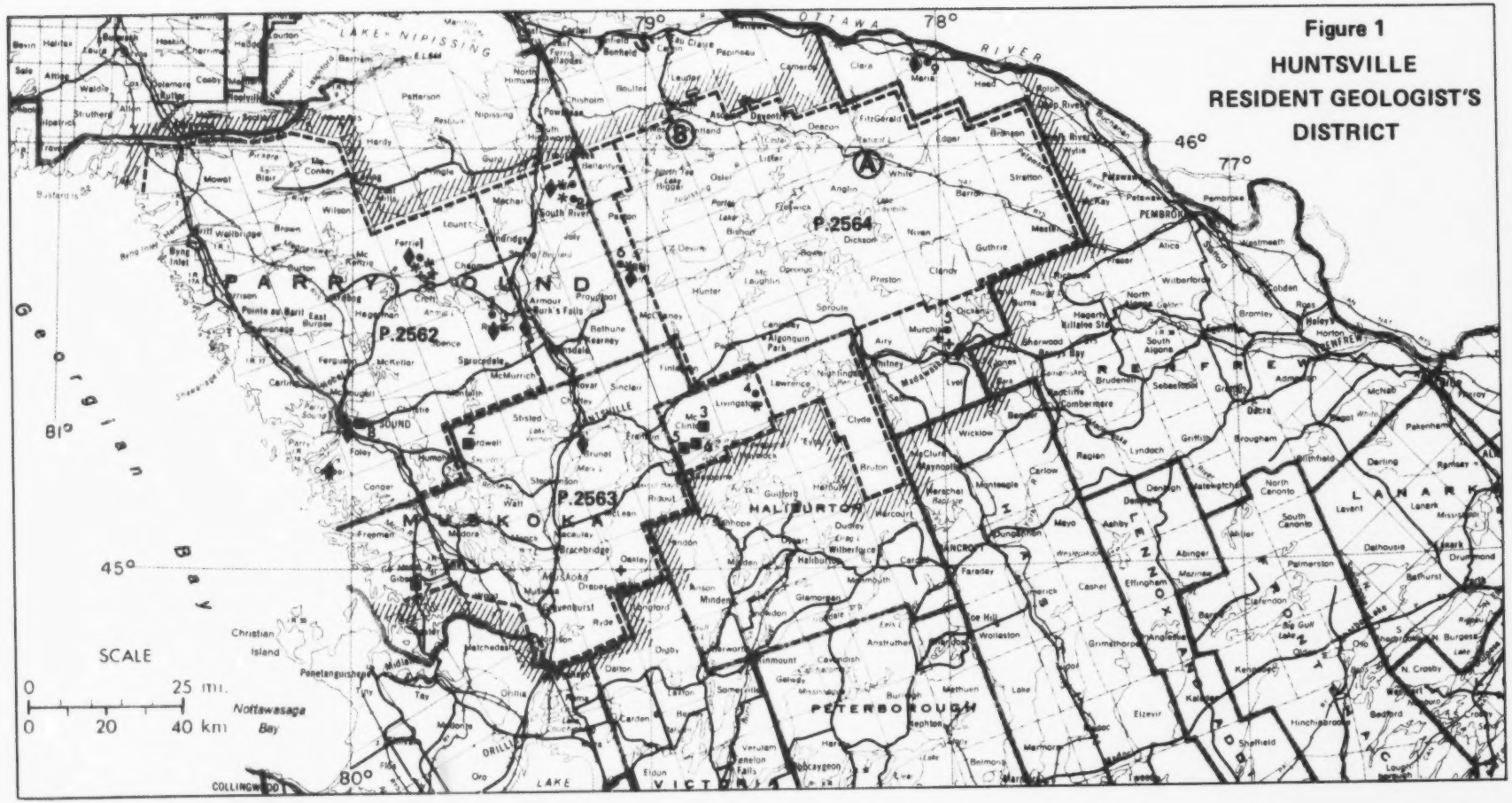
Wendy Martin completed an industrial mineral inventory of the Algonquin Region with the publication of 6 preliminary maps (Martin 1982a, 1982b, 1982c, 1982d, 1982e, 1982f).

A report summarizing the available information for each occurrence may be published.

The evaluation of the gold potential of the Central Gneiss Belt continued. Field work concentrated on the inventory of known or suspected gold occurrences.

Diamond-drill core was obtained from a quartz property (Comet Quartz) in Murchison Township, a calcium carbonate property (Burcal Mines) near Burk's Falls, and a graphite property (Vesuvius Crucible) in Butt Township.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Huntsville.



EXPLANATION

■ Producing Quarries, 1982

1. Mill Lake Quarry . . . . . building stone
2. Cardwell Tp. . . . . building stone
3. International Quartz Ltd. . . . . quartz
4. J. Cotterchio. . . . . building stone
5. L. Lock. . . . . building stone
6. O. Geldschus. . . . . building stone
7. M.T.C. . . . . construction aggregate
8. Fowler Construction . . . . . construction aggregate

Ⓐ Location of OGS Field Party in 1982

* Assessment work filed (see Table 1)

• Exploration activity in 1982 (keyed to Table 2)

♦ Property visits and/or areas recommended for exploration

\+ Claim staking in 1982

Boundary of Resident Geologist's District

--- Map or Report issued by the Ontario Geological Survey in 1982 (keyed to Table 3)
P. - Preliminary Map

Other Geological Activities

Ontario Geological Survey

John Ford and Bob Geddes, from the Engineering and Terrain Geology Section, carried out detailed mapping at a scale of 1:50 000 of the northern part of Algonquin Provincial Park. The following NTS sheets or partial sheets were covered in 1982: 31 E/14 (partial), 31 E/15 (all), 31 E/16 (partial), 31 F/12 (partial), 31 F/13 (all), 31 K/4 (partial), 31 L/1 (partial), 31 L/2 (partial), and 31 L/4 (partial).

Janet Springer of the Mineral Deposits Section examined some of the graphite occurrences in the area (Springer 1982).

Leslie M. Frost Natural Resources Centre

The past year's activities have been described in the report of the Bancroft Resident Geologist (*see* 1982 Report of the Bancroft Resident Geologist, this volume).

Rick Keevil, the acting Lands and Minerals Specialist at the Centre, has improved upon the educational aspects of the demonstration mining claim. The author feels that this demonstration claim could be used by the mining industry as a training ground for students involved in mineral exploration. Inquiries should be directed to either the L.M. Frost Natural Resources Centre (705-766-2545) or the author (705-789-9611).

Geological Survey of Canada

A. Davidson of the Superior-Grenville Section, Geological Survey of Canada, continued mapping the Grenville Province between Latitudes 45°N and 46°N from Byng Inlet to Pembroke. Mapping done during 1982 was concentrated in the area north, south, and east of Huntsville. The season ended in the western part of Algonquin Provincial Park. An Open File Report, outlining the graphite potential of the area mapped to date, was released by the Geological Survey of Canada in August (Davidson 1982). More information will be available in the Geological Survey of Canada Report of Activities to be released early in 1983.

E.H.W. Hornbrooke of the Resource Geophysics and Geochemistry Division, carried out a lake water and lake sediment/water sampling program across part of Southern Ontario. The area covered for lake water samples was either all or part of NTS sheets 31 C/N½ and 31 F. The area covered for lake sediment and lake water samples was either all or part of 31 D/NE2, 31 E/SE2, and 41 H/08. A sample density of one sample per 13 km^2 was selected for this helicopter-supported program. Samples will be subjected to various analytical processes.

C. Kaszycki, as part of a doctorate thesis at the University of Illinois, was engaged in mapping the Quaternary geology of NTS sheets 31 D/15, 31 D/16, 31 E/1, and 31 E/2. This work is being done in conjunction with the work of W.W. Shilts of the Geological Survey of Canada, dealing with the effects of acid precipitation on surficial sediments.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

Preliminary Maps - Geological Series

P.2562 P. 2565

P.2563 P. 2566

P.2564

Preliminary Maps - Data Series

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

Geological Survey of Canada Open File Reports

870

Royal Ontario Museum

S.B. Lumbers continued studies of the boundary between the Algonquin Batholith and the Grenville Supergroup and mapped in the Dorset-Haliburton area during 1982.

Exploration Activity

As of December 15, 1982, a total of 11 claims were staked in the area. Although this is a significant drop from the 113 claims staked in 1981, it is not indicative of the exploration activity. A significant proportion of the activity in 1982 was carried out on patented land.

Exploration activity was related to interests in graphite, quartz, base metals, and gold.

The location of properties on which assessment work was filed in 1982 are shown in Figure 1 and are listed in Table 2.

Graphite

Interest in graphite continued at a high level in 1982, with work being conducted on several properties. Exploration for graphite was again concentrated in the area north of Huntsville, as well as in Maria Township located roughly midway between Mattawa and Pembroke off Highway 17. Davidson (1982) believed that "The graphite occurrences of potential interest are

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1	Jones, E.	Surface trenching, copper prospect, Ferrie Township.
2	-	Geological and geophysical surveys, drilling, graphite prospect, Ryerson Township.
3	-	Geological and geophysical surveys, graphite prospect, Ryerson Township.
4	Irving, Wm.	Surface trenching, gold prospect, Livingstone Township.
5	-	Quartz prospect, Murchison Township.
6	Vesuvius Crucible	Property feasibility study, graphite prospect, Butt Township.
7	Rantala, E. J.	Trenching, copper prospect, Laurier Township.
8	Rantala, E. J.	Trenching, copper prospect, Laurier Township.
9	Blanchard, E. J.	Geological survey, graphite prospect, Maria Township.

TABLE 3 ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

Abbreviations Used:

DD - Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled respectively).
Geochem - Geochemical Survey
Geophys. - Geophysical Survey
L.U.P. - Land Use Permit
GL - Geological Survey
Mag - Magnetometer Survey
Rad - Radiometric Survey
SA - Sampling, Assays
STr - Stripping
Tr - Trenching

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Haliburton Co. Livingstone Twp.	31E/7	William Irving	gold	Sketch	Trenching	1981	2.4372	Livingstone 2
Parry Sound Dist. Ferrie Twp.	31E/12	E. T. Jones	copper	Sketch	Mechanical	1981	-	Ferrie 15
Parry Sound Dist. Ferrie Twp.	31E/12	E. T. Jones	copper	Sketch	Manual	1981	-	Ferrie 16
Parry Sound Dist. Laurier Twp.	31E/14	Edwin J. Rantala	?	Sketch	Manual	1982	-	Laurier 10
Nipissing Dist. Butt Twp.	31E/11	Guy Lahaye	graphite	Drill Log	DD 14-4095'	1982	-	Butt 21
Parry Sound Dist. Laurier Twp.	31E/14	Edwin J. Rantala	?	Sketch	Manual	1982	-	Laurier 11

within semipelitic and pelitic gneiss units within a larger paragneiss sequence. The carbon content of these rocks is considered to be of primary sedimentary origin, graphite having formed during metamorphism of carbonaceous shale, siltstone and wacke". Several people have also expressed an interest in the potential of gold being associated with these graphitic rocks.

In Butt Township, activity was limited to offsite evaluation of drill core and bulk sample results. In Ryerson Township, several properties underwent surface evaluation, with 1 property currently undergoing a diamond-drill program. In Maria Township, activity to date has been limited to a surface evaluation.

There has also been considerable reconnaissance exploration throughout the whole area as a result of the current activity and the report (Davidson 1982) on graphite released in the summer of 1982.

Base Metals

Exploration for base metals was again carried out in the area trending northeast of the Town of Parry Sound. Several local prospectors continued to work on their properties, as well as scouting the area for additional showings.

Gold

Exploration for gold was limited to work by local prospectors throughout the area. No significant showings have been reported, but the author has seen some interesting results of samples submitted for analysis by prospectors. A grab sample from the McGown Mine near the Town of Parry Sound contained 20 000 parts per million copper and 5370 parts per billion gold (Resident Geologist's Files, Ontario Ministry of Natural Resources, Huntsville). The sample was of a mineralized hornblende gneiss and was collected from a dump located beside the adit.

Quartz

Exploration for quartz continued, but was fairly low key.

Mining Activity

Numerous quarries, most notably the Mill Lake Quarry at Parry Sound, produce flagstone for use primarily as a building stone.

Recommendations

Graphite

There are numerous known occurrences of graphite in the area. These have been highlighted in reports released in 1982: Geological Survey of Canada, Open File Report 870 (Davidson 1982), and Ontario Geological Survey, Maps P.2562, P.2563, P.2564, P.2566, and P.2567 (Martin 1982a, 1982b, 1982c, 1982e, 1982f). The graphite occurs as disseminated flakes in pelitic to semi-pelitic gneisses that are only now being systematically mapped at a reconnaissance scale.

Gold

The potential for gold in the area is still virtually unknown, although there are several prospectors currently involved in exploration for this precious metal. The results of this office's gold study have not been thoroughly evaluated, but a few of the initial results are interesting.

It is hoped that results of the initial inventory will be published by the spring of 1983. The potential of gold being associated with graphite warrants further study.

Base Metals

The base metal potential of the Parry Sound area should be investigated primarily because of the possible association with gold. Several samples from the McGown Mine near Parry Sound returned values between 0.1 and 0.2 ounce gold per ton (Resident Geologist's Files, Ontario Ministry of Natural Resources, Huntsville).

Quartz

An examination of the quartz localities for sources of high purity quartz should be considered.

Rare Earths

The pegmatites throughout the area should be examined for their rare earth (e.g. gadolinium) potential.

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Kustra, C.R., ed.
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1982a: Industrial Minerals of the Algonquin Region, Parry Sound Area, Parry Sound and Muskoka Districts; Ontario Geological Survey, Map P.2562, scale 1:125 000. Compilation 1982.

1982b: Industrial Minerals of the Algonquin Region, Bracebridge Area, Parry Sound, Muskoka, Nipissing Districts and Southern Ontario; Ontario Geological Survey, Map P.2563, scale 1:125 000. Compilation 1982.

1982c: Industrial Minerals of the Algonquin Region, Algonquin Park Area, Nipissing District and Southern Ontario; Ontario Geological Survey, Map P.2564, scale 1:125 000. Compilation 1982.

1982d: Industrial Minerals of the Algonquin Region, Pembroke Area, Southern Ontario; Ontario Geological Survey, Map P.2565, scale 1:125 000. Compilation 1982.

1982e: Industrial Minerals of the Algonquin Region, Minden Area, Southern Ontario; Ontario Geological Survey, Map P.2566, scale 1:125 000. Compilation 1982.

1982f: Industrial Minerals of the Algonquin Region, Bancroft Area, Nipissing District and Southern Ontario; Ontario Geological Survey, Map P.2567, scale 1:125 000. Compilation 1982.

Matten, E.E.
1982: A Simplified Procedure for Forecasting Demand for Mineral Aggregate in Ontario; Ontario Ministry of Natural Resources, Mineral Resources Branch, Industrial Minerals Background Paper 4, 160p.

Papertzian, V.C., and Kingston, P.W.
1982a: Graphite Potential in Eastern Ontario; Ontario Geological Survey, Open File Report 5377, 89p.

1982b: Chemistry of Grenville Carbonate Rocks; Ontario Geological Survey, Open File Report 5378, Parts I and II.

Schwerdtner, W.M., and Mawer, C.K.
1982: Geology of the Gravenhurst Region, Grenville Structural Province, Ontario; p.195-207 *in* Current Research, Part B, Geological Survey of Canada, Paper 82-1B, 315p.

Springer, J.S.
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Steacy, H.R., Rose, E.R., Moyd, L., and Hogarth, D.D.
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1982: Isolation of Early Paleohelikian Remanence in Grenville Anorthosites of the French River Area, Ontario; Canadian Journal of Earth Sciences, Volume 19, Number 4, p.819-828.

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1982 Report of the Bancroft Resident Geologist

Hans D. Meyn[1]

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Introduction

The Bancroft office is responsible for Minden, Bancroft, and Pembroke Districts, which are part of the Algonquin Region (see Figure 1).

The office is staffed by Hans D. Meyn, Resident Geologist, and Karen Maxwell, Secretary.

Resident Geologist's Activities

The main thrust of the Resident Geologist's activities has been one of continued familiarization with the geology of the area and its mineral deposits. Many known, currently inactive, mineral occurrences were visited, and new properties undergoing exploration were visited in the company of the owners or operators. The operating mines were also visited.

The duties of consultation with local prospectors increased as the Resident Geologist's presence became better known. Some time was also directed to production of the final draft of the District Land Use Strategies, and attending the "Open Houses" at which these strategies were introduced to the public. The mineral management aspect of the strategies generated relatively little comment.

The Resident Geologist also participated in geological field trips, particularly those given by leaders of field parties operating in the area this summer.

In early November, a 1-day "Prospector's Class" was given jointly with Dave Villard, Resident Geologist, Huntsville, and Rick Keevil, Acting Lands and Minerals Specialist, Frost Centre, at the Leslie M. Frost Natural Resources Centre near Dorset. It is planned that this course will be offered again, perhaps in a different location, and that future courses will be tailored to demand as comments are received from participants.

In mid-November, the Mineral Management staff of the Algonquin Region was again at the Frost Centre to participate in a panel discussion of "Locking up Mineral Resources" given during a teacher's seminar held at the Centre.

The Ontario Ministry of Natural Resources, Algonquin Region, sponsored a booth at the Bancroft Gemboree and the Wilberforce Rockhound Fair again this year. At the booth, mineral oriented publications of the Ministry were for sale, and the ever popular Dr. D.H. Gorman, Professor of Mineralogy, University of Toronto, was kept very busy identifying rocks and minerals for the rockhounds.

Other Geological Activities

Ontario Geological Survey

Maps and reports pertaining to the Bancroft area issued by the Ontario Geological Survey in 1982 are shown on Figure 1, and listed in Table 1. Additional references to new information of interest in the general area are included in the list of selected references.

[1]Resident Geologist, Ontario Ministry of Natural Resources, Bancroft.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

OFR 5333 OFR 5328
OFR 5377
OFR 5378

Preliminary Maps - Geological Series

P.2488 P.2558 P.2567
P.2523 P.2565
P.2524 P.2566

Preliminary Maps - Data Series

Aggregate Resources Publications

ARIP 48

Federal - Provincial Maps

Coloured Maps

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

IMBP 2, IMBP 3, IMBP 4

Miscellaneous Reports

MP 101, MP 103, MP 105, MP 106

Geological Survey of Canada Open File Reports

Precambrian Section

A field party under the leadership of F.W. Breaks mapped the Precambrian bedrock centred on Wicklow Township (Breaks and Thivierge 1982).

The nature, distribution, and fossil content of the carbonate rocks of low metamorphic rank between Havelock and Bancroft was studied by a field party under the leadership of M.S. Bourque (Bourque 1982).

Mineral Deposits Section

The results of detailed (1:10 000 scale) mapping in the Bancroft area done by S. Masson in 1977, 1978, and 1979 were published this year (Masson 1982a, 1982b).

J.S. Springer is continuing a study of the industrial and metallic minerals of the Grenville Province. This year's emphasis was on graphite (Springer 1982).

E.P. Dillon and P.S. Barron investigated several industrial mineral deposits in some detail with emphasis on graphite and talc (Dillon and Barron 1982).

Engineering and Terrain Geology Section

P.F. Finamore completed mapping the Quaternary geology in the Fenelon Falls-Orillia area (NTS 31 D/10,11). In the latter part of the summer, he finished the Bannockburn sheet (31 C/12) with special emphasis on the Dummer Moraine (Finamore 1982).

The Aggregate Resources Inventory (ARIP) of Carden Township was released early in 1982 (Ontario Geological Survey 1981).

The map of the Brudenell Area (31 F/6) was published in 1982, based on 1978 fieldwork (Barnett and Ainsworth 1982).

Algonquin Region, Ontario Ministry of Natural Resources

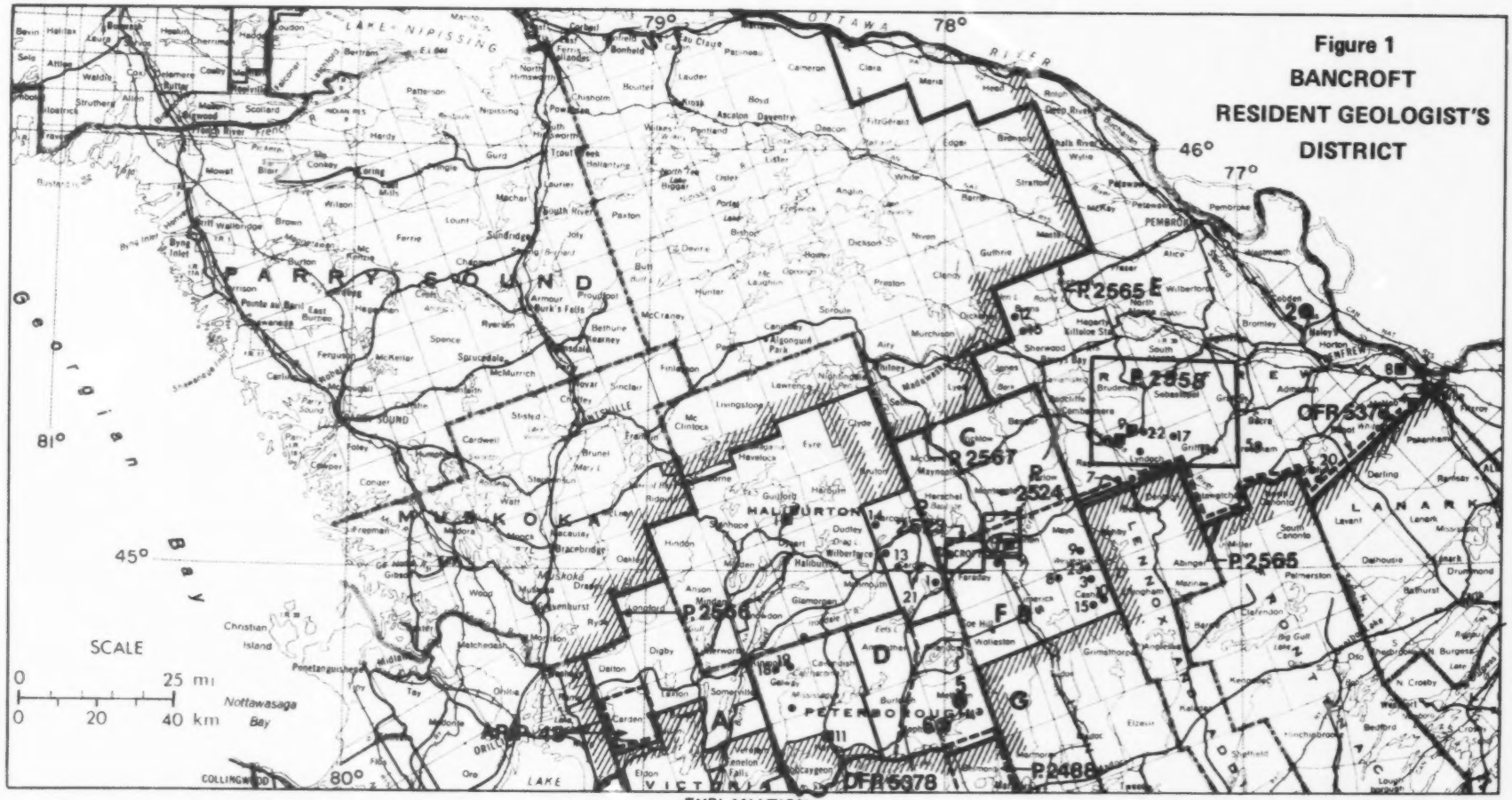
Wendy Martin published an inventory of the industrial minerals of the Algonquin Region. The maps have been released (Martin 1982a, 1982b, 1982c) and the report is to follow as an Open File Report.

Leslie M. Frost Natural Resources Centre

The Leslie M. Frost Natural Resources Centre lies partly in Bracebridge, and partly in Minden District. The following report covers activities in both districts. Mr. Rick Keevil is the Acting Lands and Minerals Specialist.

A diamond drilling program on the "model mining claim" was completed in 1982. The number of visitors to the lapidary room exceeded 5000. Also, some selected drilling was done for peat inventory purposes.

The Centre geologist assisted in other regional programmes by doing reconnaissance geophysical traverses, by cutting and slabbing selected rock samples, investigating abandoned mines, guiding and attending field trips, assisting the Dorset Seniors on a mineral collecting trip to the Bancroft area, and by assisting at the Bancroft Gemboree with a display and



EXPLANATION

- Exploration activities, 1982 (keyed to Table 2)
  For dots with no number see table 3
- Producing Mines, 1982
  - 2. Chromasco Ltd. . . . . .Mg, Ca, Sr
  - 5. IMC Chemical Group (Canada) Ltd. . neph. syenite
  - 6. Indusmin Ltd. . . . . neph. syenite
- Boundary of Resident Geologist's District

- Producing Quarries, 1982
  - 1. Bolender's Ltd. . . . . .crushed stone
  - 3. Dochart Clay Products . . . . . .clay, sand
  - 4. Hoffman Concrete Products Ltd. . .crushed stone
  - 7. Princess Sodalite Mine. . . . . sodalite
  - 8. Smith Construction Ltd. . . . . .crushed stone
  - 9. Wal-Gem Lapidary . . . . . .beryl
  - 10. Wal-Gem Lapidary . . . . . rose quartz
  - 11. A.D. Webster . . . . . .crushed stone

LOCATION OF OGS FIELD PARTIES

- A,G Quaternary Mapping . . . . . P. Finamore
- B Precambrian Mapping. . . . . .M. Bourque
- C Precambrian Mapping. . . . . .F.W. Breaks
- D Mineral Deposits Study. . . . . J.S. Springer
- E Aggregate Assessment . . R. Trotter-Kemptville
- F Mineral Deposits Section . . . Dillon & Barron
  Industrial Minerals

the showing of movies. R. Keevil also lectured at 5 Junior Ranger camps.

The regional mineral resources staff jointly gave a Prospector's Class at the Frost Centre on November 13, 1982, and participated in a panel discussion during a teacher's seminar at the Centre on November 21, 1982.

Eastern Region, Ontario Ministry of Natural Resources

The Eastern Region has investigated the graphite potential of eastern Ontario (Papertzian and Kingston 1982a) as well as the gold development potential in eastern Ontario (Kingston and Papertzian 1982). In addition, an investigation of the chemistry of Grenville carbonate rocks over the last few years is reported by Papertzian and Kingston (1982b).

Under agreement with Algonquin Region, R. Trotter, based in Kemptville, completed the aggregate assessment of Renfrew County.

Geological Survey of Canada

W.W. Shilts is continuing a program of studying the sensitivity of surficial sediments to the effects of acid precipitation. As part of this program, C. Kaszycki is engaged in preparing Quaternary geology maps of the Gooderham (31 D/16), Minden (31 D/15), Haliburton (31 E/2), and Wilberforce (31 E/1) 1:50 000 scale sheets. This work will form part of her Ph.D. thesis at the University of Illinois. As part of this work, lake bottom profiling was done on several lakes in eastern Canada, and is reported by Klassen and Shilts (1982).

E.H.W. Hornbrook conducted a program of lake water and lake sediment sampling over an area in southern Ontario, extending from Georgian Bay eastward to the Ottawa-Perth area.

V. Ruzicka continued investigations into Canadian uranium deposits, and reports on a new roadside discovery near Bancroft, and some additional work on the Halo Uranium Deposit, Cardiff Township (Ruzicka and Littlejohn 1982).

J. Rimsaite continued investigations into the mineralogy of uranium minerals, and reports on secondary radionuclide-bearing minerals in natural argillized rocks and their relation to nuclear waste disposal (Rimsaite 1982).

Royal Ontario Museum

S.B. Lumbers continued studies of the boundary between the Algonquin Batholith and the Grenville Supergroup, mapping in the Bancroft-Haliburton-Huntsville area in 1982.

Universities

J.R. Bartlett, J. Moore Jr., and J. Murray of Carleton University, Ottawa, are completing a study of Belmont Township, part of Methuen Township, and Marmora Township. Bartlett's and Murray's contribution will be a Ph.D., and M.Sc. thesis, respectively.

C. Pride, University of Ottawa, is continuing a study of the geochemical evolution of the Glamorgan Migmatitic Complex.

D. Burton, University of New Brunswick, is completing an M.Sc. thesis on the Cam Uranium Deposit, Cardiff Township.

R. Thivierge, University of Ottawa, is doing a M.Sc. thesis on the Centreville-Combermere area (Breaks and Thivierge 1982).

W. Miller, Queen's University, Kingston, is doing research on the cordierite-orthoamphibole-orthopyroxene-garnet gneisses in the Hoare Lake area, Bangor Township.

R.L. Bedell, University of Toronto, is completing a M.Sc. thesis on the structural controls of uranium-bearing pegmatite dikes of the Madawaska Mine, Faraday Township (Bedell and Schwerdtner 1982).

J.W. Card and K. Bell, Carleton University, Ottawa, are continuing their research into the use of latter-stage decay products of ^{222}Rn in radioactive waste management (Card and Bell 1982).

S.J. Haynes, Brock University, St. Catherines, is continuing his study of characterization of assimilation-type uraniferous pegmatites in the Bancroft region (Haynes 1982).

N. Culshaw, University of Ottawa, is completing a Ph.D. thesis on the structural evolution of gneisses in the northern part of the Harvey-Cardiff Arch.

L.M. Heaman, McMaster University, Hamilton, is completing his thesis on the isotopic and trace element study in the Chandos Township area (Heaman *et al.* 1982).

R.R. Miller, University of Toronto, is completing a Ph.D. thesis on the origin of the nepheline gneisses in the Bancroft area (Miller and Gittins 1982).

R.D. Hall, University of Western Ontario, London, is completing a Ph.D. thesis on the metamorphism of sulphide schists in Limerick Township (Hall and MacRae 1982).

Tsai-Way Wu, University of Western Ontario, London, is completing a Ph.D. thesis on uranium abundance, variation, and distribution in some granites from the Grenville Province, Ontario.

Exploration Activity

Exploration budgets have been sharply reduced for many companies in 1982. Overall, exploration activity in this area was less than in previous years.

The location of properties on which exploration is known to have been done, and of those on which

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1	Asbury, B.	Claim Staking (1), Cardiff Twp.
2	Axiotis, N.	Trenching, Blithfield Twp.
3	William R. Barnes Co. Ltd.	Surface Drilling, Cashel Twp.
4	Brown, W.A.	Claim Staking (2), Methuen Twp.
5	Coronation Resources (Canada) Inc.	Claim Staking (12), Mapping, Surface Drilling, Brougham Twp.
6	Crawford, R.J.	Stripping, Lyndoch Twp.
7	Crawford, R.J.	Claim Staking (1), Raglan Twp.
8	Dubblestein, A.J.	Claim Staking (4), Cashel Twp.
9	Dubblestein, A.J.	Claim Staking (1), Mayo Twp.
10	Dubblestein, A.J.	Stripping, Surface Drilling, Cashel Twp.
11	Ekstrom, R.L.V.	Claim Staking (4), Griffith Twp.
12	Hamilton, L.	Claim Staking (1), Burns Twp.
13	Hogan, E.T.	Claim Staking (2), Cardiff Twp.
14	MacFadyen	Claim Staking (15), Harcourt Twp.
15	McMurray, D.	Claim Staking (6), Stripping, Surface Drilling, Cashel Twp.
16	Murray, A.	Claim Staking (19), Surface Drilling, Burns Twp.
17	Pearse, G.H.K.	Claim Staking (7), Griffith Twp.
18	Pearson, P.G.	Stripping, Galway Twp.
19	Pearson, T.D.	Trenching, Stripping, Galway Twp.
20	Pilatzke, H.	Trenching, Blithfield Twp.
21	Pon, A.R.	Claim Staking (2), Cardiff Twp.
21	Riznek,G.G.	Claim Staking (2), Cardiff Twp.
21	Simonds, P.	Claim Staking (2), Cardiff Twp.
22	Sulpetro Minerals Ltd.	Exploration, Lyndoch Twp.
23	Young, R.	Surface Drilling, Cashel Twp.

assessment work was filed in 1982, are shown on Figure 1 and listed in Table 2.

Assessment work reports received in this office are listed in Table 3, and their locations are shown on Figure 1.

The industrial mineral potential of the area is slowly being realized by prospectors as well as exploration companies. Interest is shown in graphite, silica, calcium carbonate, mica, and talc occurrences.

Interest in graphite is maintained from last year. In late summer and early fall, 3100 feet of surface drilling was done on the 12-claim property of Coronation Resources (Canada) Incorporated in central Brougham Township. Graphite occurs associated with sulphide minerals in biotite gneisses of typical Grenville metasedimentary gneisses.

Considerable exploration for talc was carried out in Cashel Township. The talc here is the result of the alteration of mafic volcanic rocks near their contact with the Weslemkoon Batholith. Consequently, this talc is somewhat more grey in colour than talc that is derived from a white carbonate rock. Canada Talc Industries Limited carried out surface drilling on their own claims, as well as on claims owned by R. Young and A. Dubblestein. Adjacent to the Dubblestein claims, staking during the summer was followed up by stripping, trenching, and drilling for talc by D. McMurray.

Some claims have been staked in Cashel Township for calcium carbonate, and in Galway Township for silica.

The Ruby Garnet Deposit, Ashby Township, was

TABLE 3 **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

Abbreviations Used:

DD - Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled respectively).
Geochem - Geochemical Survey
Geophys. - Geophysical Survey
GL - Geological Survey
L.U.P. - Land Use Permit
Mag - Magnetometer Survey
Rad - Radiometric Survey
SA - Sampling, Assays
STr - Stripping
Tr - Trenching

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Haliburton Co. Cardiff Twp.	31E/1	A.T. Griffis	graphite	Drill Log	DD(6-971.2')	1981	-	Cardiff 206
Haliburton Co. Glamorgan Twp.	31D/16	Graeme M. Gordon	?	Geophys	Mag	1977	2.2526	Glamorgan 25
Hastings Co. Cashel Twp.	31C/13	C. Rodger Young	Talc	Drill Log & Section	DD(2-403')	1982	-	Cashel 2
Hastings Co. Cashel Twp.	31C/14	Mark A. Dubblestein	Talc	Drill Log Sketch	DD(2-381') Power STr	1982	-	Cashel 3
Hastings Co. Faraday Twp.	31E/1	Western Mintes Ltd.	Uranium	Drill Log	DD(1-250')	1979	-	Faraday 76
Hastings Co. Faraday Twp.	31F/4	Steeley Industries Ltd.	Marble	GL	mapping	1976	2.2249	Faraday 77
Hastings Co. Monteagle Twp.	31F/4	Canadian Crystal Spa Corp.	Radio-active Minerals	Geochem Geophys	assaying expenditures Tr/STr	1981	2.4161	Monteagle 16
Peterborough Co. Galway Twp.	31D/10	William R. Barnes Co. Ltd.	Silica	Drill Log	DD(1-315')	1981	-	Galway 30
Peterborough Co. Galway Twp.	31D/15	Thomas D. Pearson	?	Sketch	Manual Labour	1982	-	Galway 31
Peterborough Co. Galway Twp.	31D/16	Peter G. Pearson	?	Sketch	power STr	1982	-	Galway 32
Renfrew Co. Blithfield Twp.	31F/2	Nickolas Axiotis	?	Sketch	Tr Mechanical	1982	-	Blithfield 14
Renfrew Co. Blithfield Twp.	31F/2	Norman Pilatzke	?	Sketch	Mechanical Drilling & Tr	1982	-	Blithfield 15
Renfrew Co. Burns Twp.	31F/12	Michael Arnold Murray	?	Drill Log Sketch	DD(3-100') Manual Labour Assaying	1981-1982	-	Burns 1
Renfrew Co. Lyndoch Twp.	31F/6	Edwin L. Speelman	Uranium	Drill Log	DD(4-801')	1979	-	Lyndoch 22
Renfrew Co. Lyndoch Twp.	31F/6	Sulpetro Minerals Ltd.	Lead Zinc	Geochem GL	Sampling/A Mapping	1982	L.U.P. 73072	Lyndoch 23

restaked during the summer; some claims for garnet were also staked in Raglan Township. No additional exploration activity is reported on that property.

Uranium exploration was down considerably this year, in view of the world markets for uranium. However, work required to keep interesting properties in good standing was performed, and considerable trenching was done on claims in Blithfield Township. W.A. Blott is active on his uranium property in southern Anstruther Township.

The lead-zinc-copper-gold-silver-bearing carbonate veins of the area periodically receive new attention. The veins in Cashel Township were investigated by several parties.

The St. Charles Mine metasomatic iron deposit, Tudor Township, was resampled for precious metals. These metals are present, but the values obtained are not high enough to be of commercial interest at present.

Native silver in float is reported from the area north of Barry's Bay. This native silver looks very similar to silver from the Cobalt area. Whether this float is glacially transported from Cobalt or a source closer to Barry's Bay, remains to be investigated.

Mining Activity

Part of the nepheline syenite body in Methuen Township is being mined by Indusmin Limited near Nephton, and by IMC Chemical Group (Canada) Limited near Blue Mountain. Both companies produce a wide range of products for the glass, ceramic, and filler industries. Both companies were operating at less than capacity in 1982 because of the general economic conditions.

Chromasco Limited, near Haley Station, Ross Township, continued to produce magnesium metal in its reduction plant, from dolomite mined in 2 pits on the property. Calcium and strontium metals are also produced, but from raw materials shipped to the plant from elsewhere. Production was at less than capacity for the year; this resulted in some lay-offs.

Madawaska Mines Limited, a uranium producer near Bancroft, Faraday Township, ceased production on July 12th, 1982, because their major buyer, AGIP, the Italian energy company, cancelled its contract. The mine is being allowed to flood, but the plant and mill are being maintained.

Crushed stone for aggregate is being produced at several quarries, dolomite is being produced at Bolender's Limited in Guilford Township, and flower pots are being produced by Dochart Clay Products at Arnprior.

Recommendations

The Bancroft area is close to the major markets of Ontario, Quebec, and the eastern part of the United States, with adequate transportation routes, good access, an adequate labour pool, and other features of an infrastructure. The area must be able to compete in the industrial minerals market. At the time of writing, it is a matter of finding the right deposit. If particularly good large deposits of some pure material are found, a market should be developed for such material.

There seems to be continued interest in graphite. Most known graphite deposits in the area have been staked, and active exploration is taking place on some of them. Graphite deposits of good grade and/or size can probably be sold.

Silica continues to be imported into Ontario, and this could probably be replaced with a local product of sufficient quality. High purity silica for the electronic industry is also in demand, but likely to be only available from pegmatites or large quartz veins.

Mica as filler is still somewhat a new industry, but the potential market is seen to be excellent.

A limited, but potentially high price commodity, could be good quality soapstone for sculpture purposes.

In Ontario, several zinc mines were based on sphalerite associated with carbonate metasediments. Potential for stratiform or stratabound zinc exists in much of the carbonate belts of eastern Ontario.

Gold, at least in small quantities, is reported from several types of deposits in eastern Ontario, such as:

1) quartz veins in volcanics, felsic plutonic rocks, and metasediments
2) shear zones, with and without vein development at or near contacts, or in a mafic intrusive body
3) quartz-carbonate veins in any kind of host rock

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1982 Report of the Eastern Region Resident Geologist

P.W. Kingston[1], and V.C. Papertzian[2]

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[2]Project Geologist, Ontario Ministry of Natural Resources, Tweed.

Introduction

During 1982, industrial minerals were the focus of much-increased activity by mining companies and prospectors, by the Resident Geologist and his staff, and by the Ontario Geological Survey. Claim staking increased by nearly 21% in the Eastern Region; emphasis was on talc, calcium carbonate, and fine-grained muscovite mica. The effects of the current recession and low gold prices were seen in somewhat reduced activity for gold, base metals, stone, aggregate, cement, and silica. Some interest was given to garnet and to feldspar, 2 minerals that have not been subjected to much activity for some time.

Resident Geologist's Activities

The office of the Resident Geologist for the Eastern Region is located in Tweed, and is staffed by Paul W. Kingston, Resident Geologist, and 4 full time contract geological staff. The contract staff consist of: W.T. Grant, V.C. Papertzian, C.P. Verschuren, and D.A. Williams, and Norena Dunham, Secretary.

The office of the Regional Mines Coordinator is located in Kemptville, and is staffed by M.A. Klugman, Regional Mines Coordinator, S. van Haaften, Resource Geologist, T.W. Fletcher, Mineral Resource Manager, and 6 contract and part-time staff who include: G. Gorrell, R. Trotter, I. Kessel-Taylor, J. Bracken, A. Hinton, and D. Brand.

Six Experience '82 students were hired to work on the various geological projects in the region.

Most geological activities in the Region are managed by the Resident Geologist in Tweed, and all geotechnical engineering aggregate assessments, mineral education, and Provincial Parks projects are managed by the Regional Mines Coordinator in Kemptville.

As in previous years, much of the Resident Geologist's time was involved in providing a consultative-technical service to companies and individuals engaged in mineral exploration and mining development in Eastern Region. Selected mineral properties in the Region were visited during the year, either because of their importance to Ministry programs, or because of interest in, or work by mining and exploration companies. Emphasis was placed on examining properties currently under development, especially those involv-

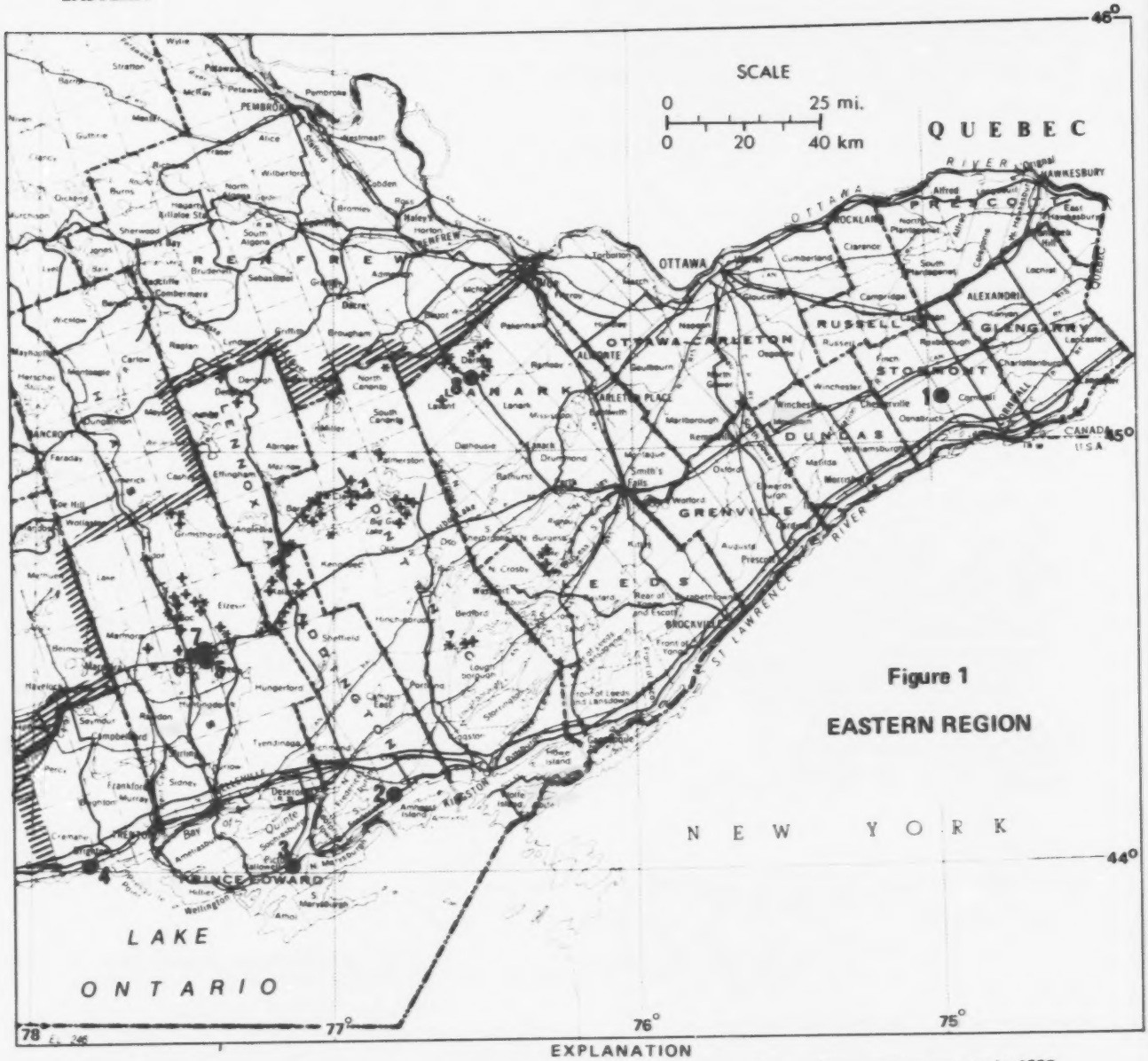

Figure 1

EASTERN REGION

EXPLANATION

● Producing Mines (except clay and aggregate extractive operations)

1. Diamond Peat Moss . . . . . peat
2. Canada Cement Lafarge Ltd. . . . . limestone, cement
3. Lake Ontario Cement Co. Ltd. . . . . limestone, cement
4. St. Lawrence Cement Co. Ltd. . . . . limestone, cement
   Ogden Point Quarry
5. Canada Talc Industries Ltd. . . . . talc
6. Grenville Aggregate Specialties Ltd. . . . . marble
7. Stocklosar Marble Quarries (1969) Ltd. . . . . marble
8. Steep Rock Ltd. . . . . calcium carbonate

+ Claim staking activity in 1982

* Assessment work filed in 1982

Boundary of Eastern Region

Figure 2

EASTERN REGION

EXPLANATION

- ▲ Exploration activity in 1982 (keyed to Table 1)
- —— Madoc map area
- ■ Mapping of high potential calcium carbonate areas
- - - - Mica mapping project
- ||||||||| Talc mapping project
- ——— Final aggregate assessment areas
- ●●●●● Slope stability study
- Saint Lawrence River Corridor mapping
- ////// Boundary of Resident Geologist's District

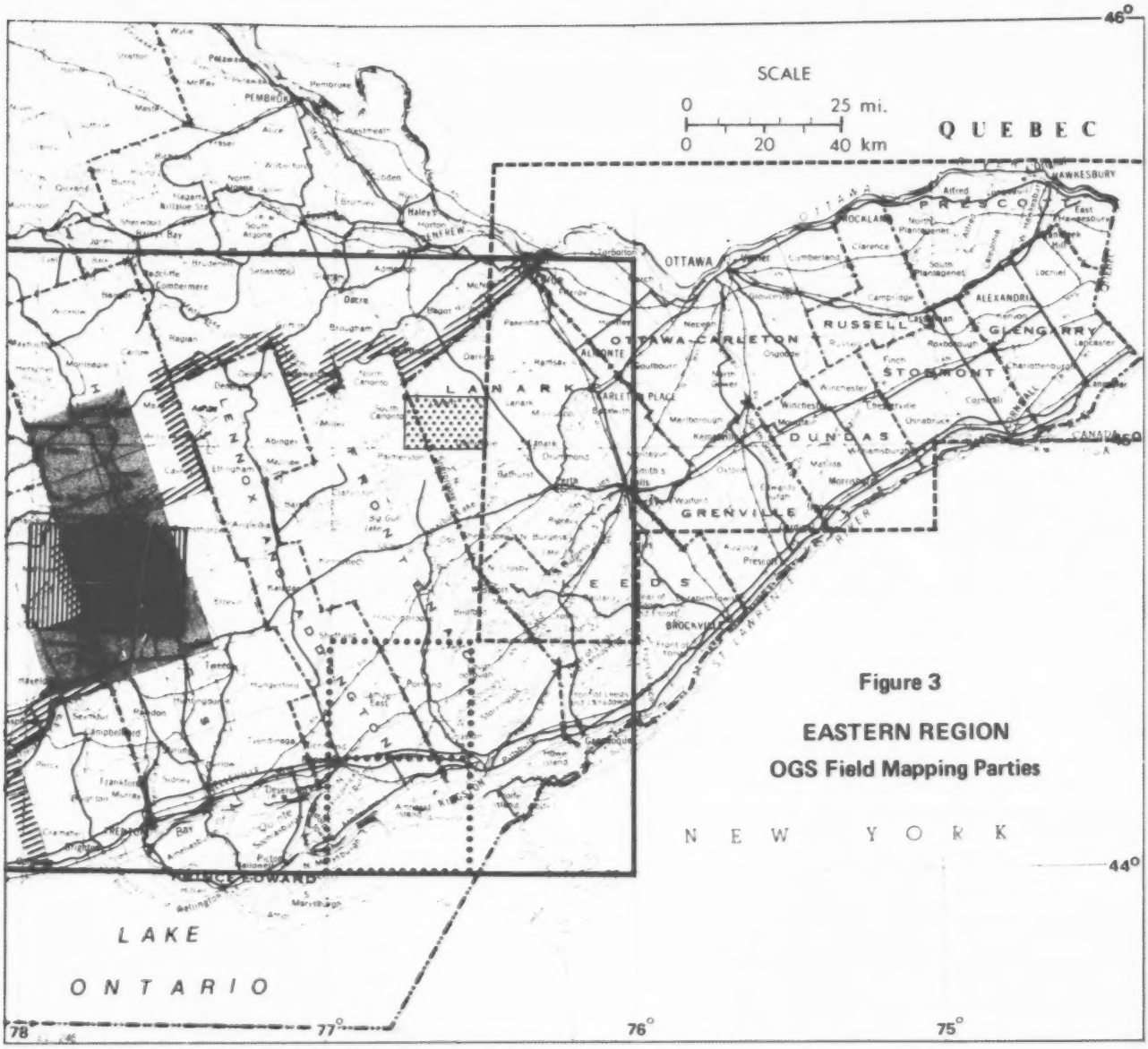

Figure 3

EASTERN REGION

OGS Field Mapping Parties

EXPLANATION

- J. S. Springer and T. R. Carter – Continuing Studies of Metallic and Industrial Minerals in the Grenville Province
- M. S. Bourque – A Regional Study of the Stratigraphy and Sedimentation of Carbonate and Associated Clastic Metasediments in the Grenville Province
- Jim Leyland – Quaternary Geology
- P. Finamore – Quaternary Geology
- Dave Williams – Paleozoic Rock Mapping
- Liba Pauk – Precambrian Geology of Lavant Area
- Boundary of Resident Geologist's District

ing industrial minerals. Other activities included conducting and attending geological field trips and tours, and providing extensive geological input into Municipal and County Land Use Plans, and for Ontario Ministry of Natural Resources District and Regional Strategies and Open House Meetings.

In October 1982, a Section 38 Special Employment Program (Mining Sector Work Program) with the Township of Barrie as Project Sponsor was set up. This project, employing 4 geologists for 26 weeks, is a mining related research project designed to stimulate interest in the exploration for, and development of, mineral resources in Barrie Township and the immediate surrounding area.

This project will provide:

1. A detailed inventory and evaluation of the development potential of mineral resources in the Barrie Township centre area;
2. Geological Data Inventory Folios for 12 townships in the area around and including Barrie Township.

This project will contribute to a larger on-going project to inventory all data on all mineral deposits in the Region.

In 1982, Open File Report 5379 entitled "Gold Development Potential in Eastern Ontario" by P.W. Kingston and V.C. Papertzian (1982) was published.

This report is based on a literature review completed in the spring of 1982. It encompasses 16 gold deposits in 3 counties: Hastings, Frontenac, and Lennox and Addington, all in Eastern Ontario. All of these deposits are Precambrian in age and are located in the Grenville Subprovince. This review analyzes the likely scale and location of any developments, and suggests which properties appear to hold the most promise.

This year, V.C. Papertzian started the field component of a 3-year project to characterize the geological, geochemical, and stratigraphic setting of the region's zinc deposits. To date, some 14 sites have been mapped in detail, and field work is expected to continue next year.

W.L. Martin was contracted for a short period late in 1982 to carry out a source document retrieval progam for the Eastern Region Mineral Resource Inventory. Martin's work involved searching all Federal Government files in Ottawa for Eastern Region mineral information.

O. Steele and V.C. Papertzian carried out site inspections, geological mapping, and sampling of approximately 140 mineral deposits in Madoc, Tudor, Elzevir, and Kaladar Townships. Hazardous mine sites were documented as part of this project.

P.W. Kingston (1982c) gave a paper entitled "Industrial Mineral Opportunities in Eastern Region" at the 84th Annual General Meeting of the Canadian Institute of Mining and Metallurgy in Quebec City, in April 1982.

As part of the Region's Industrial Minerals Program, P.W. Kingston, C.P. Verschuren, and V.C. Papertzian made field visits during 1982, to the Kelly Graphite showing, Graphite Asbury Quebec Incorporated Graphite Mine, Orrwell Energy Corporation Graphite Property, and Brebeuf Graphite Prospect, all in Quebec. A second series of field examinations of the talc properties in the Timmins area included the Steetley Talc Limited Mine in Penhorwood Township and mill in Timmins, as well as the Canadian Magnesite Mines Limited Talc Magnesite Deposit, and the Allerston Talc-Magnesite Property south of Timmins.

Two underground trips were made at the Canada Talc Industries Limited Madoc Talc Mine in connection with mapping in the area, and in conjunction with Marika Bourque of the Ontario Geological Survey to examine stromatolites adjacent to the talc ore zone. A number of visits were made to the new open pit mine currently under development a few hundred yards southeast of the present underground workings, where the Company in December 1982, mined and crushed 30 000 tonnes of talc ore for use as automotive body-patch and associated uses.

Mining Activity

Producing mines in Eastern Ontario are shown in Figure 1. The 3 cement producers (Canada Cement Lafarge Limited, Lake Ontario Cement Company Limited, and St. Lawrence Cement Company Limited) were in production throughout most of 1982, with the Ogden Point quarry closing for part of the 1982 season. The Pointe Anne Quarry operated during the summer of 1982 and is currently closed temporarily. Grenville Aggregate Specialties Limited and Stoklosar Marble Quarries (1969) Limited continued production of marble specialty products and terrazzo chips. Steep Rock Iron Mines Limited operated its white marble quarry at Tatlock, and the Perth processing plant throughout 1982. Steep Rock Iron Mines Limited will receive up to $1.35 million under the Board of Industrial Leadership and Development (BILD) program to facilitate plant expansion, employing 23 additional workers. This $5.4 million project will enlarge the plant's fine and medium grind product capacity.

Canada Talc Industries Limited continued mining and milling at their mine near Madoc. Tonnage mined this year increased about 10% to total 10 500 tons. In May 1982, The Honourable Alan W. Pope, Minister of Natural Resources, announced that Canada Talc Industries Limited will receive an amount of as much as $675,000 for plant and mine expansion under the BILD program. The expansion is to cost $2.7 million and should be completed by next year. Canada Talc Industries Limited will employ 14 new employees, and plans to produce 4 new grades of talc for the paint, plastics, and cosmetic industries. A new open pit mine is under

development, and late in 1982, 30 000 tons of ore was blasted ready for processing.

Ram Petroleums Limited processed a small tonnage of tremolite from its Palmerston Township open pit mine during part of the summer of 1982. The tremolite products will be used as additives for asphalt road construction.

Past production by Diamond Peat Moss Limited in Stormont Township continued in 1982.

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

TABLE 1

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File Number	Local File Number
Barrie Township	31/C/14	S. Bartlett	-	Assess.	STr	1981	-	#82-34
Barrie Township	31/C/14	D. A. Hardie	-	Assess.	Tr, STr	1981	-	#81-56
Barrie Township	31/C/14	D. A. Hardie	-	Assess.	Tr	1981	-	#81-55
Barrie Township	31/C/14	D. A. Hardie	-	Assess.	Assay	1981	-	#82-7
Barrie Township	31/C/14	D. A. Hardie	-	Assess.	DD1-32	1981	-	#82-6
Barrie Township	31/C/14	Sulpetro Minerals Limited	-	Assess.	Mag,EM	1981/82	-	#82-10
Barrie Township	31/C/14	Sulpetro Minerals Limited	-	Assess.	EM, Mag	1981	-	#82-11
Bedford Township	31/C/10	A. W. Renwick	-	Assess.	GL, Geochem	1982	-	#82-42
Bedford Township	31/C/10	A. W. Renwick	Qtz	Assess.	GL	1982	-	#82-43
Clarendon Township	31/C/14	S. Pearse	-	Assess.	GL, Geochem, EM	1981/82	-	#82-45
Darling Township	31/F/2	Dungarvon Resources	-	Assess.	Assay	1982	-	#82-18
Darling Township	31/F/2	Dungarvon Resources	-	Assess.	Geochem	1980	2.3948	-
Darling Township	31/F/2	Terra Surveys Limited	-	Assess.	Gr	1981	-	#81-65
Elzevir Township	31/C/11	J. L. Byer	Talc	Assess.	DD3-359	1981	-	#81-58
Elzevir Township	31/C/11	J. L. Byer	Talc	Assess.	DD2-1087	1982	-	#82-30
Grimsthorpe Township	31/C/13	J. H. Paterson	-	Assess.	Mag, EM	1981	-	#82-21
Kaladar Township	31/C/11	R. C. Longmuir and C. R. Young	-	Assess.	Mag, GL, EM	1982	-	#82-35
Kaladar Township	31/C/14	Sulpetro Minerals Limited	-	Assess.	Mag, EM	1981/82	-	#82-9
Madoc Township	31/C/12	A. D. Houston	Au	Assess.	DD 1-103	1981	-	#82-14
Madoc Township	31/C/12	A. D. Houston	-	Assess.	Mag, VLF	1981	-	#82-1
Madoc Township	31/C/12	A. D. Houston	Au	Assess.	DD 1-243	1981	-	#82-8
Madoc Township	31/C/11	R. J. Ross	Au	Assess.	DD 1-150	1981	-	#82-25
Madoc Township	31/C/11	C. R. Young	-	Assess.	DD 2-402	1982	-	#82-39
Marmora Township	31/C/5	J. Harrington	-	Assess.	Mag	1982	-	#82-46
North Burgess Township	31/C/9	Orwell Energy	gf	Assess.	Met. Prog.	1982	-	#82-31
North Burgess Township	31/C/9	Orwell Energy	gf	Assess.	Tech. report	1981	-	#82-32
North Canonto Township	31/F/2	W. Pilatzke	-	Assess.	rTr	1981	-	#81-61

Exploration Activity

In 1982, approximately 229 new claims were recorded in Eastern Ontario (an increase of 20.5% over 1981). This is 39 claims more than was staked in 1981. This increase is partly a result of increased activity by companies looking for talc, mica, and marble, as well as the continued exploration for gold.

EXPLORATION ACTIVITY DURING THE YEAR.

TABLE 2

Number on Figure	Individual or Company	Activity
1	S. Bartlett	Stripping, Barrie Township.
2	J. L. Byers	Diamond drilling, Elzevir Township.
3	J. L. Byers	Diamond drilling, Elzevir Township.
4	Canada Talc Industries Limited	Open pit development, Huntingdon Township.
5	Dungarvon Resources	Assaying, Darling Township.
6	Dungarvon Resources	Assaying, Darling Township.
7	E. & B. Explorations Inc.	Diamond drilling, Kaladar Township.
8	D. A. Hardie	Trenching and stripping, Barrie Township.
9	D. A. Hardie	Assaying, Barrie Township.
10	D. A. Hardie	Diamond drilling, Barrie Township.
11	D. A. Hardie	Trenching and stripping, Barrie Township.
12	J. Herrington	Geophysics, Marmora Township.
13	A. D. Houston	Diamond drilling, Madoc Township.
14	A. D. Houston	Geophysics, Madoc Township.
15	A. D. Houston	Diamond drilling, Madoc Township.
16	Kirkham Graphite	Bulk sampling, Bedford Township.
17	Koizumi Group Canada Limited	Bulk sampling, Kaladar Township.
18	R. C. Longmuir & C. R. Young	Geophysics and Geological mapping, Kaladar Township.
19	Ministry of Natural Resources	Metallurgical Bench Testing, Elizabethtown Township.
20	Ministry of Natural Resources	Metallurgical Bench Testing, Pittsburgh Township.
21	Ministry of Natural Resources	Metallurgical Bench Testing, Storrington Township.
22	Ministry of Natural Resources	Metallurgical Bench Testing, North Crosby Township.
23	Ministry of Natural Resources	Metallurgical Bench Testing, Ramsay Township.
24	Orwell Energy Corporation	Metallurgical Testing, North Burgess Township.
25	Orwell Energy Corporation	Technical report, North Burgess Township.
26	J. H. Paterson	Geophysics, Grimsthorpe Township.
27	G. Pearse	Geological mapping, geochemistry and geophysics, Clarendon Township.
28	W. Pilatzke	Trenching, North Cananto Township.
29	R. W. Renwick	Geological mapping and geochemistry, Bedford Township.
30	R. W. Renwick	Geological mapping, Bedford Township.
31	R. J. Ross	Diamond drilling, Madoc Township.
32	Sulpetro Minerals Limited	Geophysics, Kaladar Township.
33	Sulpetro Minerals Limited	Geophysics, Barrie Township.
34	Sulpetro Minerals Limited	Geophysics, Barrie Township.
35	Terra Surveys Limited	Geophysics, Darling Township.
36	C. R. Young	Diamond drilling, Madoc Township.

Figure 1 shows the area of claim staking activity during the year, as well as the location of properties on which assessment work has been filed.

Much of the exploration work undertaken in Eastern Ontario is on private land. Therefore, the companies are under no obligation to report their activities. Many of the companies, however, have cooperated in keeping the Ontario Ministry of Natural Resources informed of their activities. In many cases, companies have voluntarily supplied information on a confidential basis. It is, therefore, not possible to report all of the exploration activity in the Eastern Region.

Gold

A fair amount of gold exploration took place during the year. Most of the known gold properties and past producers saw some activity, ranging from diamond drilling to trenching (Figure 2).

E. Sager carried out limited diamond drilling near the former Sophia (Diamond) Gold Mine in Madoc Township.

E. & B. Explorations Incorporated of Vancouver carried out a 1000 m (3000 foot) diamond drilling program at the Addington Mine (Golden Fleece Deposit) in the summer of 1982.

Mono Gold Mines Limited performed some rock trenching on the Bannockburn Gold Mines Property in Madoc Township.

The Craig Gold Mine in Tudor Township was acquired by Guiding Resources Limited in the fall of 1982. The new owners are in the process of cutting a grid and carrying out a geological mapping and sampling program.

Al Banner, a longtime local prospector, recently acquired the former Ore Chimney Gold Mine in Barrie Township. He acquired both surface and mining rights to the property. Previously, ownership of mineral and surface rights by different parties had been inhibiting exploration progress for many years. Banner is examining the economic feasibility of installing a portable mill to treat the waste and ore dumps on the property, as well as the broken ore left in stopes by previous operators.

Base Metals

A number of properties in Madoc, Barrie, and Kaladar Townships were explored during the year for base metals. Of interest is a new chalcopyrite, molybdenite, bornite, and covellite discovery near Kaladar. The mineralization occurs in well-foliated muscovite-rich metasediments of the Flinton Group.

This is particularly interesting because a similar, newly discovered occurrence of chalcopyrite and malachite in idontical muscovite metasediments of the Flinton Group, was reported near Folger Siding in Lavant Township by Liba Pauk, during Ontario Geological Survey mapping of the Dalhousie Lake sheet this summer (Pauk 1982). The distance between the 2 copper discoveries is about 65 km, suggesting that an evaluation of the base-metal potential of Flinton Group metasediments might be rewarding.

Mica

A muscovite mica property in Kaladar Township has undergone further work since the previous year. The road access, which was upgraded last year, was again improved and a 5000 tonnes bulk sample was removed from the property in October 1982 and shipped to Japan. This fine-grained mica deposit appears to be suitable for the production of fillers for the plastics industry. New high strength mica-reinforced thermoplastic automobile components are being developed and tested by a major manufacturer.

The property was visited by the regional geological staff a number of times during the early spring and late fall. A pit approximately 100 to 150 feet long by 30 to 50 feet wide has been excavated in the bulk sampling program. The mica zone has a strike length in excess of 1.6 km and has a width of 60 to 120 m (Resident Geologist's Files, Ontario Ministry of Natural Resources, Tweed). The rock is a muscovite-quartz phyllite which in the area of the original test pit contains approximately 50% muscovite. Owing to the steep dip of the zone, selective mining of individual layers or bands yields a higher grade product.

A number of other companies are actively assessing muscovite exploration targets in the Kaladar-Hungerford area and in the Fernleigh-Ardoch area, and at least 2 companies have secured properties this year.

Talc

Canada Talc Industries Limited carried out an extensive exploration program on its property in Huntingdon Township, culminating in the delineation of a diamond-drill-proven talc orebody which is amenable to development by the open pit mining method. This new orebody lies a few hundred feet to the southeast of the existing presently mined Henderson orebody. The new deposit is estimated to contain 1 000 000 tons of talc ore to a depth of 183 m (600 feet) (Vos 1982).

Canada Talc Industries Limited and Steep Rock Iron Mines Limited have been mapping and diamond drilling talc properties in the Queensborough Road area of Elzevir Township. Both companies have identified promising ore zones. Canada Talc Industries Limited has also been evaluating 2 properties in Cashel Township this year.

Rodger Young of Havelock has been carrying out a detailed exploration program on 2 talc zones covering several claims in northeastern Madoc Township. Diamond-drilling has revealed an impressive talc zone, apparently with good development potential.

Silica

Limited exploration, sampling, and testing work has been carried out on several properties in Eastern Ontario. The silica is present in certain units of the Potsdam Sandstone lying in an area between Kingston and Perth. The William R. Barnes Company Limited removed 30 000 tons of silica ore from their quarry in the Kingston area for a production test in their Waterdown, Ontario plant.

Graphite

Graphite properties in the area have been held in good standing with the exception of a few minor prospects where the claims have lapsed. Three companies have been carrying out limited mapping and geophysical exploration. One property, the Kirkham Mine, was sampled and some bench testing on a small bulk sample was carried out to determine recovery, flake size, and flake quality. The work is continuing.

Industrial Minerals Program

This is a joint Government of Ontario and Government of Canada Program, which is part of the Canada-Ontario, Eastern Ontario Subsidiary Agreement. The program seeks to identify, catalogue, and direct attention to the industrial mineral potential of southeastern Ontario. A combined program of geological, geophysical, and mineral potential studies, mineral economies, and commodity appraisals has been undertaken to encourage the private sector to explore for industrial minerals in high potential target areas. The programs carried out in 1982 are described in the following paragraphs.

Calcium Carbonate

Open File Report 5378 entitled "Chemistry of Grenville Carbonate Rocks" was released in May 1982 (Papertzian and Kingston 1982a). The report contained all the raw chemical data on approximately 1700 samples collected in the Eastern Region. Analyses of 20 elements were carried out on each sample by the Geoscience Laboratories, Ontario Geological Survey, Toronto. Trace element data for 600 of these samples were not available at the time of publication, but have since been released in November 1982 as an appendix to OFR 5378 (Papertzian and Kingston 1982b).

W. Grant and P. Barber, regional geological staff, completed the regional sampling program, collecting 80 additional samples in Faraday and Cardiff Townships. This sampling was a continuation of the Eastern Region marble survey designed to identify areas of high calcium marble.

After examination of the chemical data for the 1700 samples, 70 sites, where CaO exceeded 54% and $SiO_2 + Al_2O_3$ was less than 1%, were selected for study. Rock of this composition is chemically suitable for the filler, lime, and whiting industry, and should be low in abrasiveness as required for use as fillers. These 70 sites were carefully mapped at a scale of 1:3600 to assess possible tonnage potential, geological continuity, and chemical consistency over a wider area. A total of 47 2 to 5 pound channel samples were collected during the field program, and will be analyzed in detail. Publication of a final report on this marble project is anticipated in 1983.

A paper entitled "Chemistry of Grenville Carbonate Rocks" was presented by P. Kingston (1982b) at the Eastern Region Industrial Minerals Seminar in Ottawa, in May 1982.

Muscovite Mica

A brief analysis of geological data on the occurrence of high grade muscovite schists in Eastern Ontario was undertaken in 1981. Results indicated potential existed for additional high grade zones in the Clare River Syncline (i.e. other than the Omya-Koizumi Property), and in the Clarendon-Palmerstone Township area. Following announcement of this analysis at the 1981 Ontario Geological Survey Geoscience Research Seminar, several companies expressed an interest.

Following the presentation of a paper by Kingston (1982c) at the Canadian Institute of Mining and Metallurgy Annual General Meeting in April 1982, 2 companies acquired properties, one each in the Kaladar and Fernleigh areas.

A paper was also presented by Kingston (1982a) at the Eastern Region Industrial Minerals Seminar in Ottawa, entitled "Muscovite Deposits and Their Potential as Sources of Mineral Fillers".

In the fall of 1982, a mica mapping program was initiated aimed at delineating the local and regional geological setting of muscovite deposits hosted by the supracrustal rocks of the region. To date, geological mapping of the Clare River Synform has been carried out by C.P. Verschuren.

Field mapping has resulted in the recognition of at least 2 and possibly 3 muscovite-quartz bearing zones which range from 30 m to 100 m in width and which have several kilometres in length. These zones, derived from aluminous sediments, vary in muscovite grade both laterally and along strike. The major gangue mineral is quartz ± biotite, garnet, plagioclase, kyanite, staurolite, sillimanite, hematite, and magnetite. Chalcopyrite, molybdenite, and pyrite are commonly associated with quartz and quartzofeldspathic zones within the quartz-muscovite schist. High grade muscovite zones average 50 to 55% muscovite and 45 to 50% quartz.

A recently formed company, Kaladar IMKO Incorporated, shipped 5000 tonnes of muscovite ore to Japan in late 1982 for further beneficiation testing. The test pit is located southwest of Kaladar on what was formerly called the Omya-Koizumi Mica Prospect.

Future mapping will be directed at the remainder of the Clare River Synform and other metasedimentary belts within the Eastern Region, particularly in the Clarendon-Palmerston Township area. A study of garnet potential for abrasive uses was started this year and is continuing to date. This program will continue as well as with the muscovite program because the 2 minerals occur together in the same geological units and settings.

Barite-Fluorite Veins

In 1981, D.A. Williams and G.B. Keep carried out field examination and sampling of 70 post-Ordovician veins composed of calcite, fluorite, barite, celestite, galena, sphalerite, and chalcopyrite. The field program is expected to result in the establishment of well-defined guidelines for exploration for additional deposits. Significant past production from vein deposits included the following: 1) approximately 136 000 t (150 000 tons) of ore grading 60% fluorite (Madoc area, 1905 to 1960); 2) approximately 907 000 t (1 000 000 tons) of high-purity calcite from a vein 20 m thick (Marlhill, 15 km north of Sharbot Lake, in production until about 1950); and, 3) approximately 820 800 t (905 000 tons) of ore grading 5% lead (Kingdon Mine 10 km east of Arnprior, 1914 to 1931).

Publication of an Open File Report on the barite-fluorite veins has been postponed because D.A. Williams was temporarily transferred to the Ottawa-St. Lawrence Lowland Paleozoic geology mapping program. This program involves a considerable amount of mapping of the structural geology that is directly related to the post-Ordovician veins. The current mapping program should, therefore contribute materially to the barite-fluorite project.

Laboratory analysis of 61 samples, collected by Williams in 1981, has been completed for 27 elements. In May 1982, D.A. Williams presented a paper at the Eastern Region Industrial Minerals Seminar in Ottawa concerning the inventory, structural analysis, and metallogenic classification of these veins (Williams 1982).

Graphite

During 1981 and 1982 a field evaluation program of graphite properties in Eastern Ontario was carried out by V.C. Papertzian and P.W. Kingston. The 54 known properties were studied in a literature survey. The 18 properties showing the most potential were mapped in detail. The survey data indicated that 8 had sufficient merit to warrant further exploration work by companies. The data was published early 1982 in Open File Report 5377, "Graphite Potential in Eastern Ontario" (Papertzian and Kingston 1982c).

By the late spring of 1982, all the graphite properties showing any promise had been acquired by a number of mining companies, and several were planning exploration programs.

Because of the positive response of the mining sector, no further work on graphite has been carried out under this program. Work by at least 3 companies is in progress. Late in 1982, all properties with any promise were held in good standing by the companies involved.

A paper titled "Graphite Development Potential in Eastern Ontario" was presented by V.C. Papertzian at the Eastern Region Industrial Minerals Seminar in Ottawa, in May 1982 (Papertzian 1982).

Talc

A project to evaluate talc deposits in southeastern Ontario was initiated in 1980. In that year, a preliminary literature review and detailed mapping and sampling of 9 deposits were undertaken. An in-house report reference was prepared, and the main results of this preliminary study were presented by A.F. Young at the Ontario Ministry of Natural Resources Industrial Minerals Seminar in Ottawa, in May 1982 (Young 1982).

During 1981 and 1982, a vigorous program of property acquisition, exploration, and diamond drilling by 3 companies tied up most of the promising talc showings in the region.

In 1982, S. van Haaften undertook further work on talc. A re-examination of the literature identified 42 talc deposits. Nine more Deposits were mapped and sampled, and an Open File Report is being prepared for possible publication in 1983. This report will summarize the results of field investigations and previous work for all known talc deposits in southeastern Ontario.

At this time, it appears that good potential for developing medium to large tonnage talc mining operations exist in:

1. Carbonate metasediments in the area of Canada Talc Industries Limited operating Mine at Madoc;
2. Altered mafic to ultramafic volcanic rocks that adjoin the Elzevir and Weslemkoon Batholiths in Elzevir, Madoc, Grimsthorpe, and Cashel Townships;
3. Carbonate metasediments at the former Eldorado Talc Mine, concessions IV and V, lots 20 and 21, in Madoc Township.

Detailed mapping of the Queensborough Road Talc Occurrence was carried out during the summer of 1982 by C.P. Verschuren and O.J. Steele. The program was specifically aimed at discovering the typical geological setting, physical and chemical characteristics, and genesis of talc deposits of mafic to ultramafic affiliation.

Field mapping of the Queensborough Road Talc Occurrence in Elzevir Township resulted in the delineation of 2 subparallel talc-bearing zones, composed of talc, serpentine, dolomite, with minor amounts of magnetite, hematite, and plagioclase. The zones are separated by an actinolite-bearing schist, the eastern

zone lying in contact with the Elzevir Batholith, while the westerly zone lies in contact with mafic metavolcanics of the Tudor Formation.

These talc-serpentine-carbonate zones are approximately 100 m to 200 m wide and extend beyond the northern and southern boundaries of the map area. Talc mineralization that is potentially of economic value is confined to small higher grade lenses within these talc-serpentine-carbonate schist zones. The vis ually estimated grade of the talc-rich lenses varies from 25 to 50% talc.

Steep Rock Iron Mines Limited and Canada Talc Industries Limited commenced detailed field evaluation of their properties on parts of the Queensborough Road Talc Occurrence this past summer. Activity to date has included mapping, sampling, diamond drilling, and limited bench-scale testing of talc zones on both properties. In December 1982, Canada Talc Industries Limited blasted about 20 tons from the high grade zone of their Queensborough Road Property. A large sample was removed for a mill test. Further details of the geology of this talc occurrence are given by Verschuren (1982).

Silica

As part of the on-going Ontario Ministry of Natural Resources program on silica, a cooperative program with CANMET was undertaken to test a number of differing grades of silica for suitability as a foundry sand. CANMET carried out the laboratory segment of the study, while the Ontario Ministry of Natural Resources provided field data and samples. Diamond-drill holes totalling 5 in number were put down in 1981 to obtain 10 m samples through the section. In addition, a 200 kg surface sample was taken from a site believed to be of foundry sand potential.

Two Open File Reports on silica in Eastern Ontario, one on high potential areas (Powell and Klugman 1979), and the other on beneficiation methods (Klugman and Yen 1980) have been published under this program.

No new field programs were carried out this year because of strong industry response to the development opportunities in silica. At least 7 major companies have been evaluating properties held in the Kingston-Perth area. Several companies have spent upwards of $0.5 million each in diamond drilling, testing, and property acquisition. In 1982, the William R. Barnes Company Limited blasted 30 000 tonnes of silica ore from their Kingston area quarry, and shipped the ore to their Waterdown processing plant for a production run.

Aggregate Resources

The aggregate assessment of the Eastern Region continued this year, funded jointly by the Provincial and Federal Governments, under the Eastern Ontario Subsidiary Agreement. The final geophysical and drilling programs were carried out for Hastings and Renfrew Counties (Figure 2).

Within the southern 12 townships of Hastings County, a total of 876.3 m of diamond drilling, 297 seismic runs, 48 conductivity lines, and 410 samples for testing were completed. The final report for all 24 townships within Hastings County will be completed by the spring of 1983.

Within Renfrew County, a total of 1206 m of drilling, 180 seismic runs, and 155 samples for testing were completed. The final report for Renfrew County will also be completed by the spring of 1983.

The final geophysical and diamond drilling programs for the County of Lennox and Addington and the County of Frontenac will be completed during the summer of 1983.

Ontario Geological Survey Activities

Field parties from the Precambrian, Mineral Deposits, and Engineering and Terrain Geology Sections of the Ontario Geological Survey were active in the Eastern Region during the 1982 season (Figure 3).

L. Pauk continued detailed mapping in the Lavant area in Frontenac and Lanark Counties at a scale of 1:15 840 (Southeastern Ontario Geological Survey (SOGS) (Pauk 1982).

M.S. Bourque continued a regional study of the stratigraphy and sedimentation of carbonate and associated clastic metasediments in the Grenville Province. Understanding of these metasediments will be of value in the search for metallic and non-metallic mineral deposits (SOGS) (Bourque 1982).

J. Leyland completed mapping of the Sydenham, Bath, and Yorkshire Islands map areas (NTS 31 C/7, 2, 3, 30 N/15) at a scale of 1:50 000 (SOGS) (Leyland 1982).

P. Finamore completed mapping of the Bannockburn area (NTS 31 C/12) at a scale of 1:50 000 (SOGS) (Finamore 1982).

D.A. Williams, R. Wolf, and A. Leroux mapped the Paleozoic geology of the Ottawa-St. Lawrence Lowland (NTS 31 C/9, 16; 31 F/1,8,9; 31 G/1,2,3,4,5, 6,7, 8,9,10,11) at a scale of 1:50 000. All accessible outcrops and available drillcore were examined.

The need to revise the Cambro-Ordovician stratigraphic nomenclature has resulted in the provisional use of the following formational names (from base to top): Covey Hill, Nepean, March, Oxford, Rockcliffe, Ottawa (Units A to E), Eastview, Billings, Carlsbad-Russell, and Queenston.

Steeply dipping normal faults and fault zones of up to 800 m vertical displacement, and striking east to northwest, are commonly exposed. Bedding, nor-

mally close to horizontal, often dips steeply adjacent to faults and within fault zones. The fault system, as determined by this study, represents a major revision of previously published work (Williams and Wolf 1982).

A.C. Colvine commenced and directed a study of mineral occurrences in the southern part of the Grenville Province (SOGS).

J.S. Springer completed a study of the significance of vein mineralogy and structural setting, of 5 gold and base-metal vein deposits in Eastern Ontario (Springer 1982a).

J.S. Springer also completed a study of graphite and other carbon-rich minerals in rocks of Grenville age. The study included examination of the Globe, Timmins, Kirkham and Bawden Properties in Eastern Ontario (Springer 1982b).

D.J. Russell, J. Graham, and O.L. White completed a study of surface stress-release phenomena in Southern Ontario. Part of this study involved detailed studies of the MacFarland Quarry near Bell's Corners, Ottawa, at the Young's Point north of Peterborough, and at Wellman's Corners north of Belleville. This study complemented the structural mapping by Williams and Wolf (1982) in Eastern Ontario this year (Russell *et al.* 1982).

M.A. Vos carried out province-wide studies on industrial mineral commodities, including work on talc and graphite in the Eastern Region (Vos 1982).

Geological Mapping

Resident Geologist's Mapping

Geological Mapping — Madoc Township

During the 1982 field season, mapping of Madoc Township was completed by C.P. Verschuren, assisted in the field by Graeme Wallace. The program, which began in May 1981 under the direction of P.W. Kingston, was initially designed to evaluate the industrial mineral potential and to a lesser degree, the base-metal potential of the Tudor metavolcanics and related metasediments in the Queensborough-Madoc-Bannockburn area. The project has since been expanded to include the geological mapping of the entire township of Madoc in order to gain a more complete understanding of the geological setting of the deposits. The emphasis is focused on industrial mineral potential with special emphasis being given to talc, silica, marble, and sulphur.

This is the second year of a 3-year project, and a preliminary report and map are planned for early 1983.

Compilation Map — Kingston Sheet NTS 31 C

Compilation of a geology and mineral deposit map for the Kingston sheet (NTS 31 C) has been completed. The map is to be published as a preliminary map in early 1983, and shows regional geology, structure, and the location of nearly 1000 mineral deposits.

St. Lawrence Parks Commission

Mapping, in conjunction with the St. Lawrence Parks Commission, of surficial and bedrock geology was carried out on the shore of the St. Lawrence River between Gananoque and Brockville (Figure 2). This mapping also included some of the islands in the St. Lawrence River.

Mineral Education Program

During the summer, regional staff visited the Murphy's Point Junior Ranger Camp. The students were given an introductory talk on the most common rocks and minerals of eastern Ontario. This was followed by a tour of the Silver Queen Mine.

Geotechnical Engineering Program

A study requested by the South Nation River Conservation Authority has been completed (Figure 2). The study determined the setback lines for safe construction along unstable slopes (factor of safety less than 1.5) in the South Nation River watershed. A total of 137 m was drilled and 36 shelby tube samples were taken. Index tests and drained triaxial tests were carried out. The drilling and soil testing program was followed by a computer analysis, which combined all the input data and determined the setback distances.

A slope stability seminar was held in the beginning of October to explain and discuss different aspects of the sensitive clay problems in the region. Old landslides and potential problem areas, as well as protective and remedial works were seen on the field excursions.

Publication of a pamphlet that will make the general public aware of the problems involved with sensitive clays has been authorized.

Provincial Parks

The interpretation of the Silver Queen Mine at Murphy's Point Provincial Park, in conjunction with Regional District Parks, continued. During the winter, an historical study of the mine was completed. Summer field work included clearing of the site, an inventory of artifacts, and the preparation of a site plan. Pumps were loaned by Parks Canada to pump the mine shafts dry so that an evaluation of the condition of the shafts could be made. In the coming year it is hoped that a development plan for the site will be completed and implemented, so that the mine may be an active interpretive site.

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1982 Report of the Central Regional Geologist

Mahendra Narain[1]

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1—Central Region 195

[1]Regional Geologist, Ontario Ministry of Natural Resources, Central Region.

Introduction

The Regional Geologist's Office at Richmond Hill and the 5 District Offices at Cambridge, Midhurst, Lindsay, Maple, and Fonthill continued to administer programs which provided geoscience information and consultative services to various government agencies, private consulting firms, the aggregate industry, prospectors, and the general public.

The Regional geoscience library has been reorganized and an index has been prepared for the convenience of library users. New reference materials, pertaining to the Central Region and the rest of Ontario, have been acquired because of an increase in demand for library consultations. New material on mineral commodities has been compiled this year for easy distribution and consultations, especially by students. All interested parties and the general public are encouraged to use this facility.

The 3 gypsum mines continued their operations, but with slower growth this year than last year. There are presently 869 licenced pit and quarry operations in the Central Region. The aggregate industry also suffered from slower growth this year than last year due to overall economic conditions.

The Regional Geologist administered geological programs related to geoscience information, data gathering, and mineral resource management, and provided technical directions and support for district geological-mineral resource programs.

Current staff at the Central Region Office includes: Lloyd Thompson, Mines Co-ordinator; Jackie Brand, Resource Geologist; and Georgina Pearson, Secretary. District Office geological staff includes Ted Harvey (Cambridge), Bill Fitzgerald (Huronia), Dennis Billings (Lindsay), Amar Mukherjee (Maple), and John Fraser (Niagara).

Regional Geologist's Activities

Resources and Land Use Planning

The District Strategy exercise continued through the year and several drafts of these documents were reviewed in the Regional Office. All Districts held open houses to discuss and explain strategies. Several changes were made to mineral resource data as a result of public and concerned group's input. The

strategy documents are now undergoing final approval. The Ministry of Natural Resources' input to the Niagara Escarpment planning process was limited to identification of new sandstone potential areas. The public hearings on the Proposed Niagara Escarpment Plan have been completed and the report of the hearing officers is expected in the new year.

A large part of the Regional Geologist's time was spent in coordinating and initiating several mineral resource studies in the Region and attending some Ontario Municipal Board hearings. The Whirlpool Sandstone resources are being evaluated by Peter Martini of Guelph University for their depositional characteristics to help delineate suitable areas for industrial exploitation. A mineral inventory of the Central Region has been completed by G.R. Guillet, a consulting industrial minerals specialist. Both of these studies are expected to be available as Open File Reports in early 1983. Also, visits were made to geologically significant sites, identified by Regional Parks and other areas ogeological interest. The Regional Geologist participated in 2 complete audits of the Districts. The following is a list of some of the geological and mineral resources inputs that were made by the Regional and District staff:

District Strategies,

Region of Durham,

Town of Caledon,

Region of Halton,

City of Cambridge,

City of Waterloo,

Town of Halton Hills,

City of Kitchener,

Townships of Hope, Cavan, Harvey, Smith, and North Monaghan.

Consultation and Educational Services

The Regional office at Richmond Hill and 5 District offices at Cambridge, Midhurst, Lindsay, Maple, and Fonthill continued to provide consultation related to geology and mineral resources legislation. There is a renewed interest in mineral rights, prospecting, and claim staking procedures. The Regional office received several inquiries on the status of old mining companies. Many of these were from people in the United States. The District staff have continued making inputs to the Aggregate Sources List of The Ministry of Transportation and Communication.

The usual public and consultant services were provided to: the Ministries of Transportation and Communications, Housing, and Labour; Conservation Authorities; Ontario Hydro; local/regional municipal governments, and the Niagara Escarpment Commission. The nature of consultations included mineral resource potential, oil and gas potential, identification of rock and mineral samples, claim staking, watertable problems, and the availability of geological and mining literature. There was increased interest by students who wanted mineral commodities information and assistance in preparation of project reports relating to mines and geology. Several inquiries related to proposed mineral resources legislation, the Mining Tax Act, and the Ontario Mineral Exploration Program (O.M.E.P.) were received. Many inquiries were received relating to mineral tax incentives offered by the Province of Ontario, including some from the United States and Alberta.

Pits and Quarries

The Regional Geologist provided input, consultation, and review of proposed mineral policies and other related matters as and when necessary.

TABLE 1 | LICENCED PITS AND QUARRIES IN THE CENTRAL REGION

DISTRICT	LICENCED QUARRIES	LICENCED PITS
Maple	10	142
Huronia	9	179
Niagara	18	15
Cambridge	27	201
Lindsay	11	257
TOTAL	75	794
TOTAL LICENCED PROPERTIES	869	

Property Examinations

The Regional Geologist, along with District staff, examined additional sandstone areas identified in Maple and Cambridge Districts. The District geologists have been involved in the field examination of both licenced and unlicenced aggregate resource areas as part of District strategies and plan inputs. Areas of Whirlpool Sandstone deposits under study by Peter Martini were also examined by the Regional Geologist and the Cambridge District Geologist.

Regional and Lindsay District staff examined a granite quarry in Belmont Township which was reopened during the year. The quarry is approximately 30 m by 20 m with a 3 to 4 m face. Several other properties were also visited to assess potential for underground mining.

Mining and Related Industrial Activity

The Central Region remains the leading producer of structural materials in Southern Ontario. The extraction of sand and gravel, limestone, shale, dolostone, sandstone, gypsum, peat, and some gold comprises the main mining activity. The 3 gypsum mines, Wes-

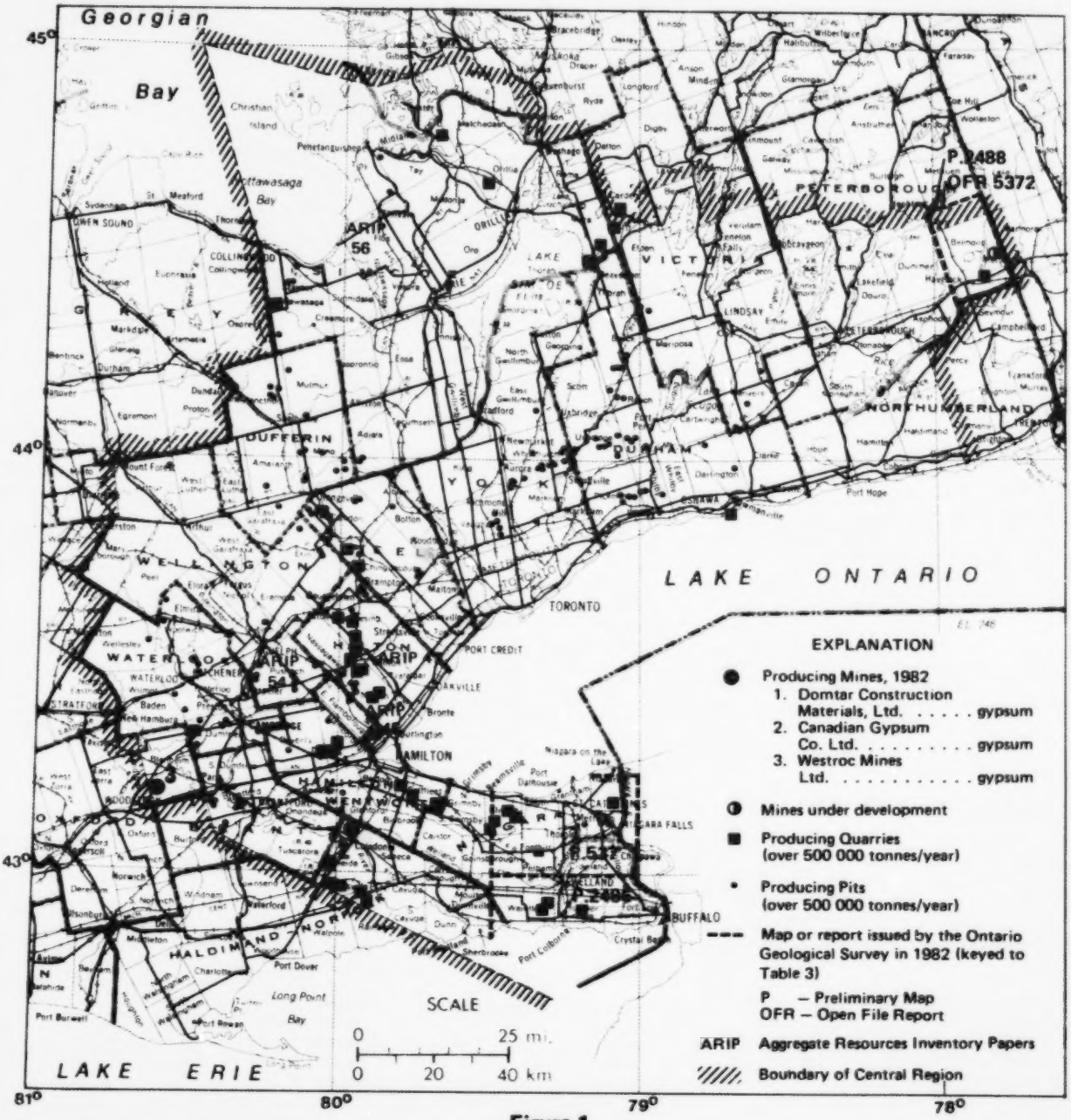

Figure 1

CENTRAL REGION

TABLE 2 REPORTED AGGREGATE PRODUCTION BY TOWNSHIP FROM LICENCED OPERATIONS IN CENTRAL REGION

HURONIA DISTRICT

Township	1979 Tonnes	1980 Tonnes	1981 Tonnes
Adjala	560,640	657,294	605,828
Amaranth	35,001	34,621	59,218
Essa	36,922	34,038	40,582
Flos	225,072	169,481	128,299
East Garafraxa	243,035	264,603	358,334
West Gwillimbury	23,587	20,978	40,411
Innisfil	172,365	220,669	228,200
Mara	586,222	610,970	919,874
Matchedash	3,810	4,940	3,944
Medonte	211,374	178,901	588,907
Melancthon	59,421	37,923	39,217
Mono	547,848	638,355	574,352
Mulmur	66,950	49,673	24,495
Nottawasaga	304,814	269,653	229,582
Orillia	2,139,412	1,902,071	2,043,185
Oro	338,742	389,247	440,642
Rama	64,954	83,284	50,005
Sunnidale	237,138	269,037	233,937
Tay	552,929	595,976	471,265
Tecumseth	113,035	51,744	57,793
Tiny	209,922	240,256	182,259
Tosorontio	79,923	73,428	80,871
Vespra	404,785	341,644	318,556
TOTALS	7,217,901	7,138,786	7,719,756

MAPLE DISTRICT

Brock	888,276	1,129,096	1,167,027
Pickering	440,234	401,330	359,652
Uxbridge	2,936,263	3,311,433	3,642,328
East Gwillimbury	194,644	131,120	201,752
East York	92,740	81,674	94,599
Georgina	283,011	342,338	298,627
King	504,478	276,605	272,276
Markham	-	-	-
Richmond Hill	12,254	115,475	575,296
Vaughan	1,296,996	974,600	327,311
Whitchurch-Stouffville	3,460,373	3,084,030	2,692,770
Brampton	1,522,937	1,690,587	1,657,559
Caledon	4,483,290	4,741,840	4,547,395
Mississauga	602,572	586,314	363,904
TOTALS	16,718,068	16,866,442	16,200,496

TABLE 2 CONTINUED

CAMBRIDGE DISTRICT

Township	1979	1980	1981
	Tonnes	Tonnes	Tonnes
City of Brantford	-	-	601,759
Brantford	1,180,802	1,194,374	319,186
South Dumfries	14,729	29,767	29,767
Onondaga	-	2,155	-
Ancaster	125,210	104,084	71,818
Flamborough	2,675,946	2,819,814	2,582,286
Stoney Creek	398,695	456,753	460,940
Blenheim	152,497	124,132	107,684
Waterloo: Kitchener, Cambridge, Woolwich	1,634,904	-	-
North Dumfries	1,042,262	689,285	757,053
Wellesley	1,105,585	624,516	678,662
Wilmot	260,204	175,691	249,595
Woolwich	224,839	363,079	318,648
Arthur	145,813	90,771	100,425
Maryborough	64,308	44,711	107,134
Peel	7,558	1,466	40,523
Nichol	-	-	-
Pilkington	376,876	296,736	264,428
West Luther	-	34,271	16,147
West Garafraxa	54,011	54,663	59,798
Eramosa	44,692	90,482	48,652
Erin	131,157	104,528	197,090
Guelph (City and Township)	309,336	336,966	408,952
Puslinch	1,951,237	1,646,644	1,601,549
Burlington	2,647,704	1,671,114	2,391,039
Oakville	-	-	-
Milton	4,894,447	5,060,370	5,588,744
Halton Hills	1,981,405	2,731,228	2,250,240
East Luther	65,902	27,030	31,966
Tuscarora	-	-	-
Town of Dundas	-	-	-
Glanbrook	-	-	-
City of Cambridge	-	31,135	1,110
City of Kitchener	-	833,790	852,975
City of Waterloo	-	-	-
TOTALS	21,490,119	19,639,555	20,138,182

Sources: MNR District Offices of Central Region

TABLE 2 CONTINUED

LINDSAY DISTRICT

Township	1979	1980	1981
	Tonnes	Tonnes	Tonnes
Alnwick	79,719	49,099	61,764
Asphodel	372,416	368,496	283,405
Belmont	432,579	359,108	228,762
Bexley-Carden	340,616	359,568	602,352
Cavan	72,305	51,895	85,546
Douro	48,802	101,114	20,781
Dummer	215,227	159,272	242,632
Eldon	39,898	86,721	67,405
Emily	273,770	334,054	190,058
Ennismore	113,939	95,665	77,266
Fenelon	649,055	465,199	652,574
Haldimand	134,099	263,379	221,768
Hamilton	241,549	366,016	239,981
Harvey	114,888	96,362	35,529
Hope	59,955	66,861	60,444
Manvers	1,318,732	1,527,349	2,220,546
Mariposa	226,802	255,808	170,960
Town of Newcastle:			
Former Tp. of Clarke	482,774	202,754	197,516
Former Tp. of Darlington	1,249,047	1,158,720	936,359
North and South Monaghan	12,150	29,778	14,841
Ops	22,620	4,463	13,670
City of Oshawa	60,640	18,177	5,546
Otonabee	91,147	90,412	192,018
Scugog:			
Former Twp. of Cartwright	249,535	118,630	50,234
Former Twp. of Reach	1,023,317	629,636	632,988
Smith	339,896	506,059	339,256
Verulam	314,942	420,777	160,496
Whitby	250,548	173,437	149,212
TOTALS	8,830,967	8,358,809	8,153,909

NIAGARA DISTRICT

Town of Dunnville	367,555	269,686	192,487
Town of Fort Erie	1,389,506	357,271	246,631
Town of Haldimand	1,334,534	960,196	1,078,983
Town of Lincoln	-	844,910	974,586
City of Niagara Falls	818,922	10,527	29,605
Town of Niagara-on-the-Lake	331,841	377,262	404,159
Town of Pelham	710,553	678,682	674,905
City of Port Colbourne	1,244,458	277,555	1,186,396
Township of Wainfleet	406,826	512,080	437,720
City of Thorold	-	1,037,119	828,777
TOTALS	6,604,195	5,325,288	6,052,249

trock Industry Limited at Drumbo, Canadian Gypsum Mines Limited at Caledonia, and Domtar Construction Materials Limited at Hagersville, continued their operations during 1982. Lasir Gold Incorporated recovered some gold from the Cordova Mines in Belmont Township.

There was a slight decrease in the number of licenced pit and quarry operations from 1981 bringing the total down to 869 from 884 during last year. The declining construction industry and increased fuel and transportation costs accounted for a decline in the overall demand for aggregate resources. In 1981 aggregate production, however, is estimated at 58.3 million tonnes, a slight increase from the 1980 production of 57.3 million tonnes (source: District and Regional Offices, Central Region).

A granite quarry in Belmont Township was reopened during the year. The quarry is being operated for dimension stone production by Fairmont Granite Limited. Four sandstone quarries are in production in the Niagara Escarpment area. Two small scale flagstone operations are located in each of Dummer and Harvey Townships.

Following are the reported highlights of some of the operations in Central Region. The information is provided by the respective companies.

Franceschini Brothers Aggregates Limited, Mississauga.

The company advises:

1982 has not been a particularly good year for our firm. Strikes in various sections of the construction industry, combined with high interest rates, resulted in a considerable decrease in sales from the year 1981. As was the case in the latter part of last year, some of our larger customers reduced their aggregate consumption and a good number of smaller customers ceased purchasing entirely.

As has been mentioned in previous years, expansion is always a consideration. However, restrictions and availability of new sites make expansion very difficult. There are no immediate expansion prospects nor are we considering any major equipment purchases in 1983.

For the coming year, our outlook can only be one of hope — hope that the economy will improve; hope that interest rates will not return to the high levels of 1982; hope that our customers will have the ability and confidence to return to their purchasing power of 1979 and 1980.

Highland Creek Sand and Gravel Company Limited, West Hill.

The company reported:

The new processing plant at the Fleetwood property in Manvers Township, Victoria County, came on stream in early 1982. Designed for an initial capacity of 400 t. per hour, the arrangement is such that capacity could be doubled without disruption should market demands dictate this.

The deposit is located near the southern extremity of the Omemee Esker, and is of considerable depth containing a high proportion of coarse gravel. The primary crushing plant is portable so that it travels along the working face, and a field conveyor system moves the material to the fixed dry plant, where secondary crushing takes place. The dry plant can be operated in closed circuit so that roadbase materials may be produced as well as material for feeding into the washing, screening and beneficiating equipment located at the fixed wet plant. A surgepile with tunnel recovery conveyor enables the dry plant and wet plant to be operated independently.

All products are stockpiled by a flexible conveyor system, and may be reloaded into a railroad system capable of handling two sixty car trains daily or into trucks for road delivery. A Masstron pitless truckscale is believed to be the first of this type in the aggregates industry in Ontario, and trucks travel over 4 km of municipal roadway reconstructed by the Company to reach a Provincial highway: thus diverting heavy truck traffic away from the nearby community of Bethany. Considerable attention to the water management system at this site ensures careful recycling of all water used, some 13,000 litres per minute. A special water draw-off arrangement controls the temperature level of water allowed to return to the local streamflow so that the fish habitat is maintained.

Steetley Industries Limited Minerals Group, Queenston Quarry, Hamilton.

The company reported:

1982 has been a depressed market for us. Both quantities and prices are below forecast.

We started opening up the new quarry north of the 4th Concession and hope to start production out of there [by the] beginning of 1983.

1982 Production = 1,900,000 Tons.

Average number of employees = 75

Overburden stripped = 700,000 Yds.^{3}

St. Marys Cement Company, Bowmanville.

The St. Marys Cement Company operates a cement plant and a limestone-shale quarry near Bowmanville. The Company facilities are located immediately south of Highway 401 at Waverley Road.

In 1963 the company undertook extensive drilling and testing of bedrock in the Bowmanville area to establish stone quality and reserve potential. In 1968, a cement plant was constructed at the site consisting of 1 kiln of 315 000 tonnes per year capacity. Plant operations began in 1969 utilizing the wet process of manufacturing. An identical kiln unit was added in 1973, thus doubling production capacity to 630 000 tonnes.

The rock quarry is about 18 ha in area and is worked in 4 benches. The uppermost bench is in the Whitby Formation (shale) which ranges from 3.5 to 5.5 m in thickness. The underlying Lindsay Formation (limestone) is mined in 3 15 m benches. The third bench is very high in calcium carbonate, and it is diluted with either about 5% shale or with low carbonate limestone from the lowest (new) bench. Currently, St. Marys is mining approximately 1000 000 tonnes annually from the quarry.

Shot rock from the quarry at the plant site is fed to a 54-inch, 900 tonnes per hour, gyratory primary crusher, capable of crushing the material down to -20 cm in size. The crushed material is then segregated and stockpiled by carbonate designation. A 500 tonnes per hour secondary crusher reduces the material down to -20 mm in size, and again the crushed material is segregated by calcium carbonate content, and stored in feed silos adjacent to the milling operation.

The crushed rock is fed to a tube mill, measuring about 10.3 m long and about 3.6 m in diameter, where approximately 30% water is added. The resulting slurry is pumped to one of these raw material storage basins, from where it is transferred to the feed end of either one of the coal-fired kilns. The kilns which are rated at 1000 tonnes per day, boil out the water, and continually raise the temperature of the material to 1400°C. At this point a physical structure change takes place, and the new crystal formation gives the sintered material its strength. To lock in the new crystal form, the sintered clinker is rapidly cooled. Cement is produced by grinding the clinker balls to extremely fine sizes and adding 5% gypsum to control the setting time. The cement is stored in silos which have a storage capacity of 75 000 tonnes.

Due to the general economic climate and a downturn in construction, the cement plant has been operating at 70 to 75% of its rated capacity for the past 2 years. Most of the cement is shipped by bulk tank truck, and some by rail. The Company is also shipping clinker by boat to its plants in Wyandotte, Michigan, and Milwaukee, Wisconsin. About ¼ of St. Mary's total production is shipped to the United States. Most of the remaining production is shipped to the Metropolitan Toronto market.

The company presently employs 120 people at its Bowmanville plant.

Steed and Evans Limited, Kitchener

The company reports:

Bridgeport Pit, Licence 46 – This pit is now depleted. This year we have backfilled 17 acres and have placed topsoil and levelled the same. This area is now ready for agriculture use.

Heidelberg Pit, Licence 5280 – Two berms have been started on the east and north sides of the pit to screen the surface areas from the public roads. These two areas will be built up further during the next season.

Fonthill Pit, Licence 195 – Work has started on 4 more fairways during the past year. Grass has been sown, trees planted, etc. Approval has not been received to date on our pit expansion, but we are still hoping this can be resolved in the near future.

Staking and Exploration Activity

No new mining claims were recorded in the Region. Presently, there are 3 mining claims, 12 mining leases, 2 patented mining claims, and 6 licences of occupation, all for mineral rights only in the Belmont Township.

Recommendations for Exploration

Recent geological information indicates additional resources of Whirlpool Sandstone (excluding currently licenced areas) in the Georgetown-Inglewood area. These resources could be explored for their suitability and availability for extraction.

Historically, the mineral production in the Region has included clay, shale, limestone, dolomite, sandstone, gypsum, marl, granite, traprock, peat moss, iron, and gold. It is believed that opportunities may exist for renewed or new development of some of these resources in view of the current geological information and an interest in developing Ontario based resources. Northern fringes of the Region, in particular, deserve attention for industrial minerals and possibly for uranium, base metals, and precious metals. Peat resources in Niagara and Maple Districts are also of interest.

Regional Geological Evaluation Projects

Central Region Mineral Inventory

G.R. Guillet, Industrial Minerals Specialist, was contracted to prepare an inventory of mineral resources (excluding aggregate resources) in the Central Region. The report has now been completed and will soon be available as an Open File Report.

Whirlpool Sandstone Resource Study

I.P. Martini of Guelph University is conducting research on depositional characteristics of this sandstone for their industrial exploitation. The report is expected to be available as an Open File Report in early 1983.

District Strategy

The Strategy documents are now in the final stages of approval.

Abandoned Pits and Quarries Studies

These studies are now complete.

Township Aggregate Inventory Papers

Forty-two papers have been published to date on townships within the Central Region. During the year, inputs were made by District staff to reports on the

following townships: Cavan, North Monaghan, South Monaghan, Town of New Castle, and Blandford-Blenheim. Cambridge staff prepared reports on Wilmot and Kitchener-Waterloo-Cambridge areas. Maple staff are preparing reports on Georgina and East Gwillimbury Townships.

Seismic Surveys

Seismic surveys were continued under the technical direction of Lloyd Thompson, Regional Mines Coordinator, in Lindsay, Huronia, Cambridge, and Niagara Districts. The surveys have been very useful in outlining glacial deposits and in determining depth of overburden. Jackie Brand supervised a summer field crew of Experience '82 students.

Identification of Sandstone Resources

Additional areas of possible sandstone resources have been identified in Cambridge and Maple Districts. Information is available at the District/Regional Offices.

Public Awareness Programs

The annual basic geology, mineral geology, and special topics courses were held from February 22nd to February 27th, 1982, in the McDonald Block, Queen's Park, attended by about 219 registrants. The special topics courses will be sponsored by the Prospectors and Developers Association. Mineral Exploration classes are scheduled for February 21st to February 26th, 1983, in the McDonald Block, Queen's Park.

Activities of the Ontario Geological Survey

M.D. Johnson examined outcrop areas of Ordovician and Devonian shales throughout Southern Ontario, with further plans of subsurface investigations of these units.

The Aggregate Assessment Office continued preparations of Aggregate Resource Inventory Papers, and have completed reports on additional townships, and some drilling carried out on Fonthill Kame deposits.

The second phase of the Southern Ontario Stream Sediment survey got underway under the supervision of J.A.C. Fortescue. The survey is designed to provide a comprehensive data base for environment and earth science investigations at a scale of 1:50 000.

J.S. Springer continued studies of metallic and industrial minerals in the Grenville Province.

M.A. Vos continued the industrial mineral studies of Ontario with emphasis on Alkalic Complexes and building stone.

M.S. Bourque continued her study of the stratigraphy and sedimentation of carbonate and associated metasediments in the Grenville Province. An enhanced understanding of these metasediments will be of value in the search for metallic and non-metallic mineral deposits.

TABLE 3 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

OFR 5328
OFR 5361

Preliminary Maps - Geological Series

P. 2488
P. 2541

Preliminary Maps - Data Series

P. 537 (revised)
P. 2486
P. 2499

Aggregate Resources Publications

ARIP 45 ARIP 56
ARIP 47
ARIP 54

Federal - Provincial Maps

Coloured Maps

CM 2441

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

MP 2 MP 99
MP 3 MP 101

Geological Survey of Canada Open File Reports

Geoscience Research

R. Nadon and J.E. Gail, of the University of Waterloo, continued their field, laboratory, and numerical modelling study to determine the impact of groundwater on surface mining activities in the Niagara Escarpment area. The field site is located near Dufferin Quarry, 8 km north of Milton, Ontario.

Recommended Recent References

Cox, F.C., and Harrison, D.J.
1980: The Limestone and Dolomite Resources of the Country Around Wirksworth, Derbyshire; Her Majesty's Printing Office, London, 137p.

Downing, D.O., and Mackenzie, B.W.
1979: Public Policy Aspects of Information Exchange in Canadian Mineral Exploration; Centre for Resource Studies, Kingston, 53p.

Hoek, E., and Brown, E.T.
1980: Underground Excavations in Rock; The Institution of Mining and Metallurgy, London, 527p.

Johnson, W., and Paone, J.
1982: Land Utilization and Reclamation in the Mining Industry, 1930-80; U.S. Department of the Interior, Washington, 22p.

Longstaffe, F.J.
1981: Clays and the Resource Geologist; Mineralogical Association of Canada, Toronto, 199p.

McClelland, G.E., and Eisele, J.A.
1982: Improvements in Heap Leaching to Recover Silver and Gold from Low-Grade Resources; U.S. Department of the Interior, Washington, 26p.

Ontario Federation of Labour
1982: Occupational Health and Safety: A Training Manual; Copp Clark Pitman, Toronto, 288p.

Tank, R.W.
1976: Focus on Environmental Geology: A Collection of Case Histories and Readings from Original Sources, 2nd Edition; Oxford University Press, New York, 538p.

Whitmore, F.C., Jr.
1981: Resources for the 21st Century: Summary and Conclusions of the International Centennial Symposium of the U.S. Geological Survey; U.S. Geological Survey, U.S. Department of the Interior, Washington, 41p.

1982 Report of the Southwestern Regional Geologist

Rae Booth-Horst[1], B.H. Feenstra[2], and L.C. Walkom[3]

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Introduction

Personnel of Southwestern Region are responsible for Petroleum Resources within the whole Province of Ontario as well as for the Mineral Resources program within the Southwestern Region. Staff are located at 2 offices in London: the Southwestern Regional Office at 1106 Dearness Drive, and the Petroleum Resources Laboratory at 458 Central Avenue.

[1]Chief Geologist, Petroleum Resources Laboratory, Ontario Ministry of Natural Resources, London; Regional Geologist, Southwestern Region, Ontario Ministry of Natural Resources, London.
[2]Mineral Resources Geologist, Southwestern Region, Ontario Ministry of Natural Resources, London.
[3]Geological Assistant, Southwestern Region, Ontario Ministry of Natural Resources, London.

Permanent staff at 1106 Dearness Drive are: P.A. Palonen, Provincial Petroleum Supervisor and Southwestern Region Mineral Resources Coordinator; R.M. Rybansky, Reservoir Engineer; E. Habib, Reservoir Engineer; G. Tanton, Engineering Technologist; P. Wright, Geological Assistant; L.R. Laceby, Senior Draftsperson; I. Cameron, Senior Draftsperson; and A.M. Martyniuk, Secretary. Personnel at the laboratory are: Rae Booth-Horst, Chief Geologist and Southwestern Regional Geologist; B.H. Feenstra, Mineral Resources Geologist; Robert A. Trevail, Senior Petroleum Geologist; Cathy Hesselmans, Data Processing Technician; and M. Campbell, Laboratory Technician. Lloyd Walkom and Debra Parker, Geological Assistants on contract, compiled the information in the tables of this report.

Petroleum Resources Inspectors responsible for enforcement of the Petroleum Resources Act, and Pits and Quarries Inspectors responsible for enforcement of the Pits and Quarries Act, are located at various District Offices.

Regional Geologist's Office Activities

Petroleum Resources Activities

In addition to several new projects, the Petroleum Resources geological staff conduct ongoing research. In order to maintain consistency for mapping purposes, the petroleum geologists determine the formation tops for samples from approximately 200 wells drilled in Ontario for petroleum each year. The samples are also analyzed to determine the presence of precious and base metals, petroleum trapping mechanisms, and data quality. During the 1981 to 1982 fiscal year, the formation tops in the majority of 237 1980 wells, 200 1981 wells, and approximately one third of 157 1982 wells were determined. Drill cuttings from all 1981 and the 1982 wells were sorted, washed, and catalogued. The computerized data bank of production and field information was updated to include 1981 information, and currently contains information on approximately 14 000 wells drilled in Ontario.

A study initiated in 1981, to better define and standardize the subsurface stratigraphy in Southwestern Ontario, is continuing. The project involves selecting and describing "Type Wells" representative of the

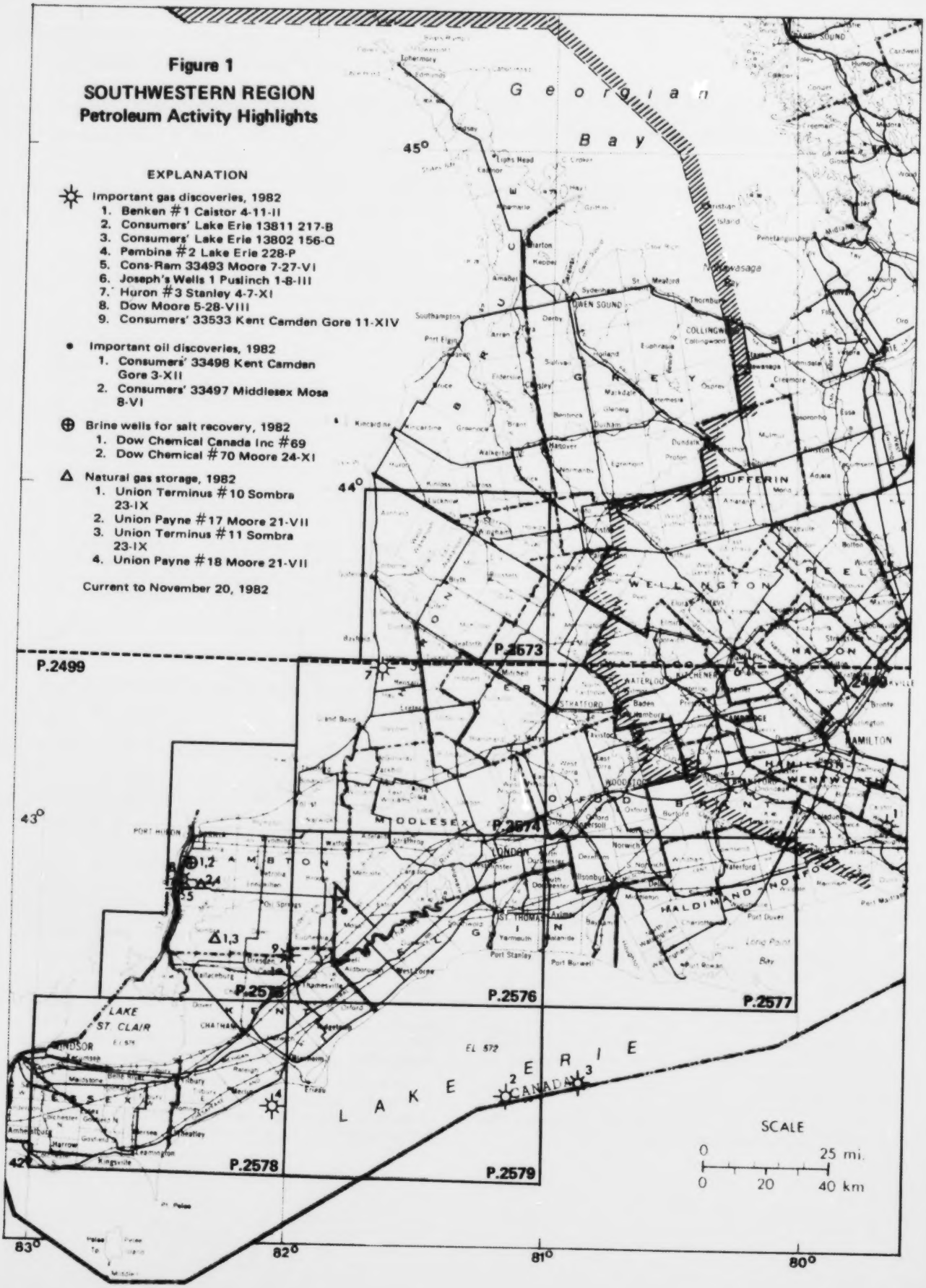
Figure 1
SOUTHWESTERN REGION
Petroleum Activity Highlights
EXPLANATION
Important gas discoveries, 1982
1. Benken #1 Caistor 4-11-II
2. Consumers' Lake Erie 13811 217-B
3. Consumers' Lake Erie 13802 156-Q
4. Pembina #2 Lake Erie 228-P
5. Cons-Ram 33493 Moore 7-27-VI
6. Joseph's Wells 1 Puslinch 1-8-III
7. Huron #3 Stanley 4-7-XI
8. Dow Moore 5-28-VIII
9. Consumers' 33533 Kent Camden Gore 11-XIV
Important oil discoveries, 1982
1. Consumers' 33498 Kent Camden Gore 3-XII
2. Consumers' 33497 Middlesex Mosa 8-VI
Brine wells for salt recovery, 1982
1. Dow Chemical Canada Inc #69
2. Dow Chemical #70 Moore 24-XI
Natural gas storage, 1982
1. Union Terminus #10 Sombra 23-IX
2. Union Payne #17 Moore 21-VII
3. Union Terminus #11 Sombra 23-IX
4. Union Payne #18 Moore 21-VII
Current to November 20, 1982
Georgian Bay
LAKE ERIE
LAKE ST. CLAIR
P.2499
P.2573
P.2574
P.2575
P.2576
P.2577
P.2578
P.2579
SCALE
0 25 mi.
0 20 40 km
45°
44°
43°
42°
83°
82°
81°
80°

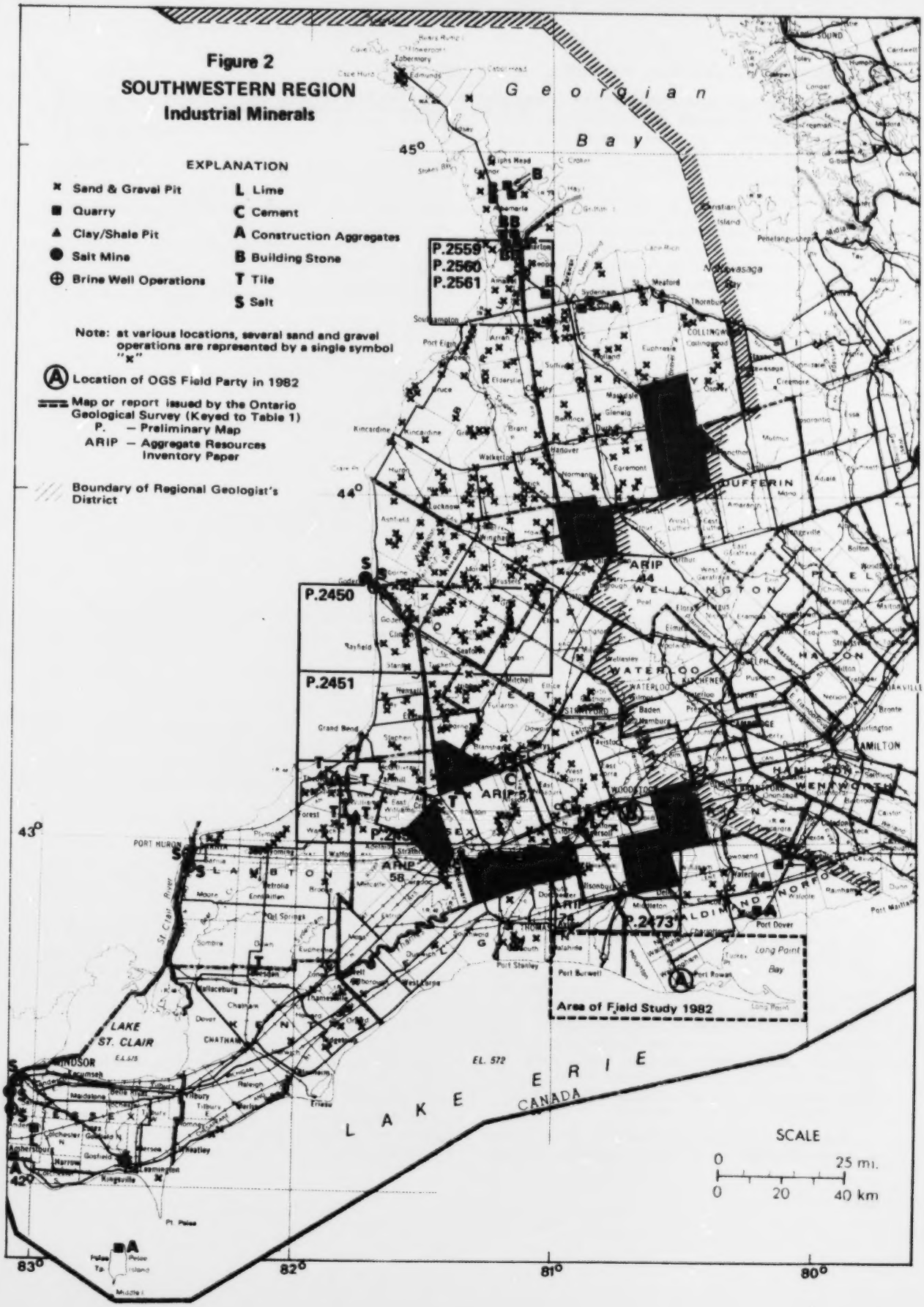
Figure 2
SOUTHWESTERN REGION
Industrial Minerals
EXPLANATION
Sand & Gravel Pit
Quarry
Clay/Shale Pit
Salt Mine
Brine Well Operations
L Lime
C Cement
A Construction Aggregates
B Building Stone
T Tile
S Salt
Note: at various locations, several sand and gravel operations are represented by a single symbol "x"
Location of OGS Field Party in 1982
Map or report issued by the Ontario Geological Survey (Keyed to Table 1)
P. – Preliminary Map
ARIP – Aggregate Resources Inventory Paper
Boundary of Regional Geologist's District
P.2559
P.2560
P.2561
P.2450
P.2451
P.2473
ARIP 44
ARIP 58
Area of Field Study 1982
Georgian Bay
LAKE ST. CLAIR
LAKE ERIE
CANADA
EL. 572
SCALE
0 25 mi.
0 20 40 km
45°
44°
43°
42°
83°
82°
81°
80°

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Report 220

Open File Reports

OFR 5328

Preliminary Maps - Geological Series

P. 2450
P. 2451
P. 2452
P. 2453
P. 2454
P. 2455
P. 2499
P. 2559
P. 2560
P. 2561

Preliminary Maps - Data Series

P. 2573
P. 2574
P. 2575
P. 2576
P. 2577
P. 2578
P. 2579

Aggregate Resources Publications

ARIP 43
ARIP 44
ARIP 51
ARIP 57
ARIP 58
ARIP 66
ARIP 73
ARIP 74
ARIP 75

Federal - Provincial Maps

Coloured Maps

Map 2473

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

IMBP 2
IMBP 3

Miscellaneous Reports

Oil and Gas Paper 3

Geological Survey of Canada Open File Reports

Miscellaneous Publications

AAPG Paper: Oil and Gas Developments in Eastern Canada in 1981

stratigraphic section in different parts of Southwestern Ontario. Approximately 15 "Type Wells" are targeted and will be utilized to generate stratigraphic cross-sections of Southwestern Ontario.

Funds from the Board of Industrial Leadership and Development (BILD) were allocated to the Petroleum Resources Section to conduct a study entitled "Evaluation of the Conventional and Potential Oil and Gas Reserves of Ontario". The project objective is to provide the petroleum industry and the Ontario Ministry of Natural Resources with an evaluation of the oil and gas reserves and potential of the Paleozoic of Ontario. All the basins, including Southwestern Ontario, the St. Lawrence Lowlands, and the James Bay and Hudson Bay Lowlands, will be re-evaluated in the study.

An evaluation of the stratigraphy, geochemistry, and structure of the Cambrian and Ordovician of Southwestern Ontario as related to oil and gas exploration, is in progress. Preliminary structural contour maps at a scale of 1:250 000 have been prepared for important horizons. Computerized records of wells that intersect Ordovician or deeper strata have been released to industry. In addition, a computer printout listing the subsea elevation of the Precambrian and thickness of the Cambrian and the Shadow Lake, Gull River, Coboconk, Kirkfield, Sherman Fall and Cobourg Formations, has been provided.

An annual status report on petroleum exploration in Eastern Canada in 1981 was compiled and written for the American Association of Petroleum Geologists. This report summarized activity in Ontario and eastern Canada, showing exploration and production trends. The same report is scheduled to be published by the Canadian Society of Petroleum Geologists.

Preliminary computer-generated structural and isopachous maps (1:250 000 scale) and drift thickness maps of the Collingwood, Kettle Point, and Marcellus Formations were made available for the Oil Shales Project of the Ontario Geological Survey.

Mineral Resources Activities

Mineral resources activities of the regional geologist's office included: provision of base geological and aggregate resources data for preparation of inventory reports for Bentinck, Glenelg, Sullivan, and Holland Townships in Grey County, by the Aggregate Assessment Office (Ontario Geological Survey); initiation of a regional compilation of mineral aggregate potential; and property examinations of both operating and proposed pit and quarry operations. In addition, a geological study of a landslide in Owen Sound was conducted by the mineral resources staff.

Consultative and educational services were provided to: the Region and District offices in the form of land use plans, proposed pit and quarry plans, act administration and enforcement and review of proposed legislation and guidelines; Junior Rangers; other provincial agencies; and private consultants, academics, and the public in general.

Ontario Geological Survey Activities

Engineering and Terrain Geology Section

During 1982, the Engineering and Terrain Geology Section continued to evaluate the oil shale potential of Southwestern Ontario. Phase one of the study consisted of field investigations and drilling to evaluate the potential of the Ordovician Collingwood shale. A similar program to evaluate the potential of the Devonian Marcellus and Kettle Point shales began in late 1982.

During the summer of 1982, P.J. Barnett of the Engineering and Terrain Geology Section and his assistants mapped the surficial geology of the Long Point-Port Burwell area along the shoreline of Lake Erie (Figure 2a). Local geological concerns include loss of land to erosion along Lake Erie, gullying, failure along deeply incised creeks, loss of topsoil by wind erosion, drainage in finer textured materials, sources of water for irrigation, and lack of course granular aggregate sources. Subsurface drilling to provide further stratigraphic information began in the fall of 1982.

During 1982, staff of the Aggregate Assessment Office conducted brief field investigations, including drilling and geophysical surveys, of sand and gravel deposits in the following townships: Sullivan, Holland, and Derby in Grey County; Hullett in Huron County; Wallace, Elma, and Logan in Perth County; Bosanquet in Lambton County; and East Williams, West Williams, and McGillivray in Middlesex County.

In Southwest Oxford Township in Oxford County (Figure 2b), P.J. Barnett of the Ontario Geological Survey, and V.H. Singhroy of the Ontario Centre for Remote Sensing, investigated the contribution of airborne infrared remote sensing to delineation of surface, and detection of near-surface deposits of sand and gravel. Further studies will be continued in 1983.

TABLE 2 SUMMARY OF WELL COMPLETIONS FOR 1982

COUNTY & Township	EXPLORATORY Gas	Oil	Dry	Total	Metres	DEVELOPMENT Gas	Oil	Dry	Total	Metres	OTHER Total	Metres
BRUCE	-	-	-	-	-	-	-	-	-	-	1	446.5
Albemarle	-	-	-	-	-	-	-	-	-	-	1 strat test	446.5
ELGIN	2	-	3	5	2929.5	6	1	10	17	10563.6	3	588.2
Aldborough	-	-	1	1	169.2	-	-	-	-	-	1 disp.	195
Bayham	-	-	-	-	-	-	-	-	-	-	1 twin.	317
Dunwich	-	-	-	-	-	-	-	-	1	1105	-	-
Lake Erie	2	-	-	2	1250.3	6	-	10	16	9458.6	1 anchor mooring	76.2
S.Dorchester	-	-	1	1	1085	-	-	-	-	-	-	-
Yarmouth	-	-	1	1	475	-	-	-	-	-	-	-
ESSEX	-	-	2	2	905	-	-	2	2	1434.4	-	-
Lake Erie	-	-	1	1	460	-	-	-	-	-	-	-
Malden	-	-	-	-	-	-	-	2	2	1434.4	-	-
Tilbury N.	-	-	1	1	445	-	-	-	-	-	-	-
GREY	-	-	1	1	1575	-	-	-	-	-	-	-
Keppel	-	-	1	1	1575	-	-	-	-	-	-	-
HALDIMAND	-	-	2	2	788	20	-	4	24	8877.2	-	-
Lake Erie	-	-	2	2	788	17	-	4	21	8286.0	-	-
N.Cayuga	-	-	-	-	-	1	-	-	1	224	-	-
Oneida	-	-	-	-	-	1	-	-	1	182.8	-	-
Seneca	-	-	-	-	-	1	-	-	1	184.4	-	-
HURON	1	-	2	3	1809.9	-	-	-	-	-	-	-
Stanley	1	-	2	3	1809.9	-	-	-	-	-	-	-
KENT	2	1	5	8	5438.2	3	5	7	15	4764.3	4	2107.8
Camden	-	-	-	-	-	-	2	-	2	235.3	-	-
Camden Gore	1	1	-	2	609.5	-	-	-	-	-	-	-
Chatham Gore	-	-	1	1	655.3	-	-	-	-	-	-	-
Howard	-	-	2	2	1833.5	-	-	-	-	-	-	-
Lake Erie	1	-	-	1	599.4	3	-	4	7	3459.5	-	-
Tilbury East	-	-	-	-	-	-	1	-	1	478.0	4 obs.	2107.8
Zone	-	-	2	2	1740.5	-	2	3	5	591.5	-	-

TABLE 2 continued

COUNTY & Township	EXPLORATORY Gas	Oil	Dry	Total	Metres	DEVELOPMENT Gas	Oil	Dry	Total	Metres	OTHER Total	Metres
LAMBTON	2	-	12	14	9774.5	-	10	1	11	2957.1	6	3975.5
Dawn	-	-	1	1	610.5	-	1	1	2	1205.6	-	-
Enniskillen	-	-	2	2	1347	-	5	-	5	718.5	-	-
Euphemia	-	-	2	2	1103	-	4	-	4	1033	-	-
Moore	2	-	1	3	2257	-	-	-	-	-	2 brine	1499.5
Plympton	-	-	1	1	771.7	-	-	-	-	-	2 gas str.	1361
Sarnia	-	-	3	3	2404	-	-	-	-	-	-	-
Sombra	-	-	2	2	1281.3	-	-	-	-	-	2 gas str	1115
LINCOLN	1	-	-	-	132.6	3	-	-	3	439.5	-	-
Caistor	1	-	-	-	132.6	2	-	-	2	283.5	-	-
Gainsborough	-	-	-	-	-	1	-	-	1	156	-	-
MIDDLESEX	-	1	-	1	135	-	5	-	5	1055	-	-
McGillivary	-	-	-	-	-	-	1	-	1	575	-	-
Mosa	-	1	-	1	135	-	5	-	5	597	-	-
NORFOLK	-	-	1	1	621.0	15	-	10	25	11756.7	-	-
Charlotteville	-	-	-	-	-	4	-	3	7	2762.3	-	-
Houghton	-	-	-	-	-	2	-	2	4	1818	-	-
Lake Erie	-	-	1	1	621.0	8	-	5	13	6757.9	-	-
S.Walsingham	-	-	-	-	-	1	-	-	1	418.5	-	-
OXFORD	-	-	-	-	-	-	-	1	1	277.7	1	2.8
Dereham	-	-	-	-	-	-	-	1	1	277.7	1 re-entry	2.8
WELLAND	-	-	-	-	-	5	-	-	5	1172.3	-	-
Humberstone	-	-	-	-	-	1	-	-	1	265.2	-	-
Wainfleet	-	-	-	-	-	4	-	-	4	907.1	-	-
WELLINGTON	1	-	-	1	719.2	-	-	-	-	-	-	-
Puslinch	1 susp		-	1	719.2	-	-	-	-	-	-	-
TOTAL* 1982	9	2	28	39	24877.9	52	21	36	109	43414.8	15	7120.8
TOTAL (1981)	7	2	38	47	27245.6	68	9	53	130	56333.0	14	5071.9

* not including 4 lost holes

TABLE 3 LAKE ERIE DRILLING 1982

COUNTY	EXPLORATORY Gas	Dry	Total	Metres	DEVELOPMENT Gas	Dry	Total	Metres	OTHER Total	Metres
ELGIN	2	-	2	1250.3	6	10	16	9458.6	1 (Anchor Mooring)	76.2
ESSEX	-	1	1	460	-	-	-	-	-	-
HALDIMAND	-	2	2	788	17	4	21	8286.0	-	-
KENT	1	-	1	599.4	3	4	7	3459.5	-	-
NORFOLK	-	1	1	621.0	8	5	13	6757.9	-	-
TOTAL 1982	3	4	7	3718.7	34	23	57	27962.0	1	76.2
(1981)	7	12	19	9482.5	36	40	76	36136.4	0	-

	# wells	Metres
1982 total *	64	31680.7
1981 total **	95	45618.5

* not including 1 lost hole and 1 anchor mooring

** not including 3 lost holes

Ontario Geological Survey Research Grants

The following persons received Ontario Geological Survey Research Grants:

R.F. Mereu, University of Western Ontario — "A Micro-Earthquake Survey of the Gobles Oil Field Area of Southwestern Ontario";

J.E. Gale, University of Waterloo — "Impact of Groundwater on Surface and Subsurface Mining Activities in the Niagara Escarpment";

J.F. Barker, University of Waterloo — "Source, Correlation and Thermal Maturation History of Hydrocarbon Deposits of Southern Ontario";

R.N. Farvolden, University of Waterloo — "Subsurface Quaternary Stratigraphy Using Borehole Geophysics";

U. Brand, Brock University — "Source Rock Geochemistry of Pleistocene Tills of Southern Ontario";

P.H. Von Bitter, University of Toronto — "Chert Resources of Southern Ontario. Petrographic, Palynologic, and Stratigraphic Characteristics".

Oil and Natural Gas

The following preliminary statistics include data obtained from wells drilled between January 1 and December 4, 1982. The 1982 figures are compared with data for wells drilled from January 1 to December 5, 1981, as published in the 1981 Report of the Southwestern Regional Geologist. Final figures will be available in "Oil and Gas Exploration, Drilling, and Production Summary, 1982" (Oil and Gas Paper 5) to be published in 1984.

Most petroleum and natural gas exploration and development in Ontario was conducted in the Southwestern and Central Regions. Table 2 is a summary of wells drilled in Ontario during 1982, listed by county and township. A total of 167 wells (including 4 lost holes) were drilled in 1982 as compared to 196 wells (including 5 lost holes) in 1981. This represents a decrease of 14.8%. The total number of metres drilled decreased 15.4% from 89 637 m in 1981 to 75 875 m in 1982.

During 1982, 39 exploratory and 109 development wells were completed, showing a decrease of 17.0% in the exploratory class and a decrease of 16.2% in the development class as compared to 1981. In addition, 15 holes including 1 re-entry, 1 twinned, 1 stratigraphic, 4 observation, 1 disposal, 1 anchor mooring, and 4 gas storage wells were drilled.

Offshore drilling statistics for natural gas in Lake Erie are shown in Table 3. Drilling on Lake Erie decreased 32.6% from 95 wells in 1981 (not including 3 lost holes) to 64 wells in 1982 (not including 1 lost hole and 1 anchor mooring). By November 20, 1982, 1532 wells had been drilled in Lake Erie.

Of the 64 wells drilled offshore in 1982, 7 were classified as exploratory wells and 57 were classified as development wells of known pools. Offshore drilling was 57.8% successful during 1982 with 37 of 64 wells being producers. A total length of 31 884.9 m of section was penetrated under Lake Erie during 1982, down 30.6% from the 45 618.5 m drilled in 1981.

All of the available gas exploration and production rights in Lake Erie continue to be held or are under commitment. Of approximately 1.1 million ha available, 321 898 ha are presently under lease, whereas 595 316 ha are under exploratory licence of occupation, for a total 917 214 ha.

On land, a total of 101 wells, including 14 "other" and 3 lost holes, were drilled for a total length of 43 990.3 m. Land wells were 56.0% successful, with 8 of 32 exploratory wells and 39 of 52 development wells being producers. During 1982, the success of drilling in Ontario onshore and offshore combined was 56.8% as compared to 49.0% in 1981. Twenty-three wells, including 2 exploratory and 21 development wells, were completed as oil producers during 1982.

Total oil produced in Southwestern Ontario in November 1981, inclusive, was approximately 90 200 m^3 whereas approximately 410 106 m^3 of gas was produced from January 1, 1981, until September 1982. No oil production is permitted from Lake Erie under international agreement.

Industrial Minerals

Aggregates

The total production of sand, gravel, stone, clay, and shale during 1981, from 528 of 790 licenced pits and quarries in Southwestern Region, was approximately 19.5 million tonnes (Table 4). The increase in sand and gravel production resulted from total designation of the Region under the Pits and Quarries Act during 1981 when 757 pit operations were licenced as opposed to 426 during 1980. Stone production in Southwestern Region in 1981 decreased 23% as compared to 1980.

As in 1980, a total of about 3 million tonnes of sand and gravel was extracted by wayside pit operations in 1981.

Most of the stone quarried in 1981 is for use in the manufacture of high-calcium lime by Beachvilime Limited and Domtar at Beachville, by Allied Chemical Canada Limited at Amherstburg, and by Stelco at Ingersoll (Figure 2). Other major uses include construction aggregate, as well as grey Portland cement manufacture by Canada Cement Lafarge Limited of Woodstock and St. Marys Cement Company Limited at St. Marys (Figure 2). Federal White Cement of Woodstock manufactures white Portland cement

AGGREGATE PRODUCTION FROM LICENCED PITS AND QUARRIES DURING THE YEAR. (1981)

TABLE 4

District	Number of Designated Townships	Number of Licensed Pits and Quarries *	Sand and Gravel (Tonnes)	Stone (Tonnes)	Clay and Shale (Tonnes)	Total (Tonnes)
Aylmer	29	128	6 282 816	2 773 894	236 988	9 293 699
Chatham	34	70	2 099 038	1 906 182	21 204	4 026 424
Owen Sound	28	139	2 350 001	180 044	4 770	2 534 815
Simcoe	15	24	485 413	198 797	1 768	685 978
Wingham	32	167	2 396 852	372 789	177 846	2 947 487
TOTALS	138	528	13 614 121	5 431 706	442 576	19 488 403

* Producing

Sources: Ministry of Natural Resources District Offices in Southwestern Region, 1982

utilizing local sources of high-calcium limestone and imported high-alumina clay and silica.

Dolomite of the Wiarton-Colpoy Bay and Eramosa Members of the Amabel Formation is utilized by 6 small building stone operations in the Owen Sound-Hope Bay area of the Bruce Peninsula (Figure 2). Thick-bedded Wiarton-Colpoy Bay dolomite from the Adair Quarry of Angelstone Limited is being used in reconstruction of the Rideau Canal locks in Ottawa and the Port of Quebec.

Of the clay and shale production from licenced operations in the Region, 92.5% is clayey glacial drift used as a source of silica and alumina in the local manufacture of grey Portland cement at Woodstock and St. Marys. Most of the remainder of the clay and/or shale produced is used in the local manufacture of clay drainage tiles at Dresden, Thedford, Parkhill, Meaford, and Norwich (Figure 2). Another clay drainage tile manufacturer, the Paisley Brick and Tile Company, applied in 1982 for a licence to operate its clay pit at Paisley. Clay tile manufacturers in the Region are competing with manufacturers of less costly, flexible plastic tubing. Last year, Rydall Brick and Tile of Elginfield stopped manufacturing clay drainage tiles because of rising costs while a plastic drainage tile manufacturer opened a new plant in Alvinston, east of Sarnia.

Salt

Ontario's salt production comes from underground mines and brine well operations in the Salina Formation at Goderich, Sarnia, Windsor, and Amherstburg (Figure 2).

At Goderich, Domtar's Sifto Salt Division operates an underground mine and evaporating plant. The mine produced approximately 1.5 million tonnes of rock salt in 1981, and approximately 2 million tonnes in 1982. The rock salt is used for de-icing of roads (60 to 70%), in the chemical industry for the manufacture sodium and chlorine compounds, and for such general uses as water softening. A third mine shaft has been sunk to a depth of 536 m below the surface in the A-2 unit of the Salina Formation. This major expansion, to be completed in the spring of 1983, will increase production capacity by 55% to more than 3 million tonnes per year, and will increase employment by more than 50 workers.

Domtar's Sifto Salt Division evaporating plant produced approximately 100 000 tonnes of salt in 1981, and about 110 000 tonnes in 1982 from 2 operating brine wells. About 50% of the salt is used as food-grade salt, 30% in the chemical industry, and the remainder for agricultural purposes. A new brine well is scheduled for production in 1984.

Dow Chemical of Canada Limited also recovers salt from brine wells in the vicinity of its Sarnia evaporating plant for the manufacture of caustic soda and chlorine. During 1981, 635 000 tonnes of salt were produced from 12 operating brine wells, as compared to 589 600 tonnes from 15 wells during 1980.

The Canadian Rock Salt Company Limited's Ojibway Mine near Windsor produces rock salt from the E unit of the Salina Formation at a depth of approximately 305 m below the surface.

The Canadian Salt Company Limited's evaporating plant (Windsor Fine Salt) produced 146 348 tonnes of salt in 1981, and approximately 125 000 tonnes in salt, 42% for use in the chemical industry (mainly in the pulp and paper industry in Northern Ontario), and the remainder for agricultural purposes (livestock, etc). Installation of new silo facilities for improved salt storage and distribution is nearing completion.

Allied Chemical Canada Limited obtains salt brine from wells in the vicinity of its Amherstburg plant for the manufacture of soda ash and by-product calcium chloride by the Solvay process. Salt production in 1981 was 539 692 tonnes from 8 operating wells, and 511 820 tonnes from 6 operating wells in 1982.

Theses Projects

University of Western Ontario

Bird, T.—Geology of the Kettle Point Black Shale

Burtch, S.—A1 Evaporite - Guelph Reef (Upper Silurian); Relationships for Terminus, Southern Ontario

MacKay, W.—A Resume Study of the Duthill Oil/Gas Field Located in Sombra Township, Lambton County, Ontario

McMurray, M.—Cambrian Geology of the Clearville Oil Field, Southwestern Ontario

Musgrove, R.—Stratigraphy of Amherstburg and Bois Blanc Formations

Parkin, G.—Glacial Geology and Sedimentology of Three Pleistocene Sections in Lobo Township, Southwestern Ontario

Silver, C.—Stratigraphic Study of the Dundee-Detroit River Groups in the Subsurface, Southwestern Ontario

University of Waterloo

Loftsson, M.—Mechanical Properties of Oil Shales

Hewetson, J.—Migration of Contaminants in Fractured Shale at an Abandoned Landfill on the Niagara Escarpment

Coakley, J.P.—Quaternary History of Long Point

Miles, M.—Isotope Geochemistry of Salina Carbonates and Groundwater

Pehme, P.—Borehole Geophysics of Quaternary Materials

Tworo, A.—Lead Zinc Occurrences in the Middle Silurian of Southern Ontario

Slaine, D.—Geophysical Mapping and Subsurface Contaminants

Guelph University

Martini, P.—Pleistocene Sedimentology - General Studies

McMaster University

Middleton, G., and Martini, P. (Guelph University)—Sedimentology of the Whirlpool Sandstone

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Palonen, P.A., and Booth-Horst, Rae
1982: Oil and Gas Developments in Eastern Canada; American Association of Petroleum Geology Bulletin.

ONTARIO GEOLOGICAL SURVEY

1982
SUPPLEMENT
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Ontario
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Rocks and Minerals Information, 1982; by staff of the Ontario Geological Survey. This booklet contains numerous sources of information on the earth sciences.
(Stock No. 5409). No Charge

††**Sogs - Southeastern Ontario Geological Survey,** 12 p. Printed in English and French. (Stock No. 5007).
No Charge

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Price: $20.00

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Publications Price List, September 1982; Ontario Geological Survey and Mineral Resources Branch Miscellaneous Publication, 146p.
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OFR 5325 **Mineral Potential Map of Ontario, Northeastern Sheet**, compiled by Janet S. Springer, J.A. Robertson and M.A. Vos, 1979.

OFR 5326 **Mineral Potential Map of Ontario, West Central Sheet**; compiled by Janet S. Springer, J.A. Robertson and M.A. Vos, 1979.

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OFR 5333* **Index to Geoscience Data Recorded in Exploration Reports Submitted by the Mining Industry**; compiled by S. Sun and T. Pauk, Geoscience Data Centre, Ontario Geological Survey.

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OFR 5361 **Quaternary Geology and Industrial Minerals of the Niagara-Welland Area**, Southern Ontario; by B.H. Feenstra, 260p., Appendices A-L, 5 tables, 22 figures, 21 photographs, 6 maps and 4 charts.

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OFR 5379 **Gold Development Potential in Eastern Ontario;** by P.W. Kingston and V.C. Papertzian, 36p., 1 figure and 2 tables.

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OFR 5385** **Preliminary Report on the Paleozoic Geology of the Southern Portion of the Ottawa-St. Lawrence Lowland,** Southern Ontario; by D.M. Carson, 49p., 2 figures.

OFR 5387 **Grant No. 75 - Chemical Treatment of Chrysotile Asbestos in Laboratory Solutions** by Mark Hyatt, N.D. Macrae, and H.W. Nesbitt, 79p. 1 figure, 3 tables, 28 photographs and 2 appendices.

OFR 5388++ **Industrial Minerals of Northern Ontario - Supplement 1;** by M.A. Vos, T. Abolins and V. Smith, 344p., 3 figures and 1 table.

OFR 5389 **Ontario Research Grant Program, Grant No. 46 - Potential for Chromite Deposits in Ontario;** by D.H. Watkinson and P.R. Mainwaring, 142p., 1 figures, 1 photograph and 8 appendices.

OFR 5390 **Ontario Geoscience Research Grant Program, Grant No. 27 - Field Relations and Geochemistry of Au, Ni and Cr Deposits in Ultramafic-Mafic Volcanic Rocks, Parts 1 and 2;** by R. Kerrich, D. Robinson, R.L. Barnett, R.W. Hodder and R.W. Hutchinson, 33p., numerous figures and tables, 4 appendices.

OFR 5391++ **Talc, Magnesite and Asbestos Deposits in the Kirkland Lake-Timmins Area;** by Ulrich Kretschmar and Dianne Kretschmar, 146p., 29 figures, 18 tables, 3 photographs and 3 appendices.

OFR 5392 **Aggregate Resources of the Fonthill Kame, The Town of Pelham, Regional Municipality of Niagara;** by the Ontario Geological Survey, 105 p., 6 appendices, 34 figures, 1 map in back pocket.

OFR 5393 **Peat Production Plan for the Galbraith Bog,** District of Algoma; by Turveruukki Oy, 112p., 10 tables, 26 figures and 3 appendices.

OFR 5394*** **Mid-Density (S.G. 2.81-3.32) Mineralogy of Glacial Overburden as an Indicator of Gold Mineralization in Benoit, Maisonville, Grenfell, Eby, Otto, Boston and McElroy Townships,** Districts of Timiskaming and Cochrane; by Jeanette Lourim, 120p., 2 appendices, 3 tables, 8 figures.

OFR 5395*** **Mid-Density (S.G. 2.81-3.32) Mineralogy of Glacial Overburden as an Indicator of Gold Mineralization in Melba and Morrisette Townships and portions of Lebel, Eby, Bisley and Arnold Townships,** Districts of Timiskaming and Cochrane; by Jeanette Lourim, 104p., 2 appendices, 3 tables, 9 figures.

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All coloured maps are $1.00 each unless otherwise specified.

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Map 2441 (Reprint) **Geological Highway Map, Southern Ontario.** Edited by E.B. Freeman, revised 1979. Scale 1:800 000.
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Map 2450 **Otter Lake,** Sudbury District (41 I/10,15). Geology by B. Dressler and assistants, 1977, 1978. Scale 1:31 680 or 1 inch to 1/2 mile. Stock Number 10 646

Map 2451 **Massey Bay,** Sudbury District (41 I/10,15). Geology by B. Dressler and assistants, 1977, 1978. Scale 1:31 680 or 1 inch to 1/2 mile. Stock Number 10 647

Map 2453*** **Burntbush-Detour Lakes Area,** District of Cochrane (32 E/4, 32 E/5, 32 E/12, 32 E/13). Geology by G.W. Johns and assistants, 1978. Scale 1:100 000.
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Map 2455 **Timmins,** Ontario (42 A/6). Geology by D.R. Pyke and assistants, 1973. Scale 1:50 000.
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Map 2456 **North Arm of Sturgeon Lake,** Thunder Bay and Kenora Districts (52 J/1, 52 J/2). Geology from published maps of the Ontario Geological Survey; supplementary mapping by N.F. Trowell and assistants, 1975, 1976. Scale 1:50 000. Stock Number 10 652

Map 2457 **Sturgeon Narrows,** Districts of Thunder Bay and Kenora (52 G/16). Geology from published maps of the Ontario Geological Survey; supplementary mapping by N.F. Trowell and assistants, 1975, 1976. Scale 1:50 000.
Stock Number 10 653

Map 2458 **Whiterock Lake,** District of Kenora (52 G/14). Geology from published maps of the Ontario Geological Survey and the Geological Survey of Canada; supplementary mapping by N.F. Trowell and assistants, 1975, 1976. Scale 1:50 000. Stock Number 10 654

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ONTARIO GEOLOGICAL SURVEY P. NUMBER MAPS

All P. number maps are 50 cents each unless otherwise stated.

P.537 (Rev.) **Drift Thickness of the Niagara and Niagara-on-the-Lake Area,** Southern Ontario (30 M/3, 30 M/6E). Compilation by B.H. Feenstra, 1973 to 1975.
Scale 1:50 000.

P.996 (Rev.) **Farrington Lake Area,** Kenora District (52 J/6, 7W). Geology by J.R. Trusler and assistants, 1974.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2186* **Belfast Township,** Nipissing District (41 I/16; 41 P/1); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2187* **Telfer Township,** Sudbury District (41 I/15); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2188* **Afton Township,** Sudbury District (41I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2189* **Scholes Township,** Sudbury District (41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2192* **McCarthy Township,** Sudbury District (41 I/15, 16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2193* **Macbeth Township,** Sudbury District (41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2194* **Clement Township,** Nipissing District (41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2195* **Vogt Township,** Nipissing District (41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2196* **Torrington Township,** Nipissing District (31 L/13; 41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2198* **Kelly Township,** Sudbury District (41 I/9,10,15,16); Sudbury Data Series. Data compiled by Richard Adlington, 1980.
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P.2199* **McNish Township,** Sudbury District (41 I/9, 41 I/16); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2200* **Pardo Township,** Nipissing District (41 I/9, 41 I/16); Sudbury Data Series, Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2425 **Uranium and Thorium Deposits of Ontario, Northwest Sheet,** Kenora District (Patricia Portion) (43 C, D, E, F, K, L, M, N; 53 A, B). Compilation by J.A. Robertson, 1973-1974, 1980-1981.
Scale 1:1 013 760 or 1 inch to 16 miles.

P.2426 **Uranium and Thorium Deposits of Ontario, East Central Sheet,** Thunder Bay, Algoma, Cochrane, Sudbury, Timiskaming and Nipissing Districts (31 K, L, M; 32 D, E, L; 41 I, J, K, M, N, O, P; 42 A, B, C, D, E, F, G, H, I, J, K, L). Compilation by J.A. Robertson, 1973-1974, 1980-1981.
Scale 1:1 013 760 or 1 inch to 16 miles.

P.2427 **Uranium and Thorium Deposits of Ontario, West Central Sheet,** Kenora District (Patricia Portion), Thunder Bay, Algoma and Cochrane Districts (41 K. N; 42 C, D, E, F, K, L, M, N; 43 C, D; 52; 53 A, B, C, D). Compilation by J.A. Robertson, 1973-1974, 1980-1981.
Scale 1:1 013 760 or 1 inch to 16 miles.

P.2429 **Precambrian Geology of the Partridge Point Area, Lightning River Area,** Cochrane District (32 D/12W). Geology by L.S. Jensen and assistants, 1973.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2430 **Precambrian Geology of the Mistaken Islands Area, Lightning River Area,** Cochrane District (32 D/12E). Geology by L.S. Jensen and assistants 1973.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2431 **Precambrian Geology of the Ghost Range Area, Lightning River Area,** Cochrane District (32 D/12W). Geology by L.S. Jensen and assistants, 1973.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2432 **Precambrian Geology of the Lightning Mountain Area, Lightning River Area,** Cochrane District (32 D/12E). Geology by L.S. Jensen and assistants, 1973.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2433 **Precambrian Geology of the Lightning River Area,** Cochrane District (32 D/12). Geology by L.S. Jensen and assistants, 1973.
Scale 1:63 360 or 1 inch to 1 mile.

P.2434 **Precambrian Geology of the Magusi River Area,** Cochrane and Timiskaming Districts (32 D/5). Geology by L.S. Jensen and assistants, 1968-1972.
Scale 1:63 360 or 1 inch to 1 mile.

P.2439 **Precambrian Geology of Chabanel Township,** Algoma District (42 C/2). Geology by R.P. Sage and assistants, 1980, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2440 **Precambrian Geology of Esquega Township,** Algoma District (42 C/2); Geology by R.P. Sage and assistants, 1980. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2441 **Precambrian Geology of McMurray Township,** Algoma District (41 N/15, 42 C/2); Geology by R.P. Sage and assistants, 1980.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2442 **Precambrian Geology of Lastheels Township,** Algoma District (41 N/15, 42 C/2); Geology by R.P. Sage and assistants, 1980.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2450 **Drift Thickness of the Goderich and Seaforth Areas,** Southern Ontario (40 P/11,12). Compilation by A.J. Cooper and L.P. Nicks, 1979, 1980.
Scale 1:50 000.

P.2451 **Drift Thickness of the Grand Bend Area,** Southern Ontario (40 P/5). Compilation by A.J. Cooper and assistants, 1979, 1980. Scale 1:50 000.

P.2452 **Drift Thickness of the Parkhill Area,** Southern Ontario (40 P/4). Compilation by A.J. Cooper, 1979, 1980.
Scale 1:50 0000.

P.2456* **Howey Township,** Sudbury District (41 P/2). Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2457* **Grigg Township,** Sudbury District (41 I/15, 41 P/2). Sudbury Data Series-Preliminary Map. Data Compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2458* **Fraleck Township,** Sudbury District (41 I/15). Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2459* **McConnell Township,** Sudbury District (41 I/15E); Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2460* **Parkin Township,** Sudbury District (41 I/15W) Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2461* **Wisner Township**, Sudbury District (41 I/10W, 11E, 14E, 15W); Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2462* **Norman Township**, Sudbury District (41 I/10W, 15W); Sudbury Data Series-Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2463* **Beaumont Township**, Sudbury District (41 I/14, 41 P/3); Sudbury Data Series, Data compiled by Richard Adlington, 1981.
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P.2464* **Emo Township**, Sudbury District (41 I/13, 41 I/14); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2465* **Rhodes Township**, Sudbury District (41 I/14); Sudbury Data Series. Data compiled by Richard Adlington, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2466* **Botha Township**, Sudbury District (41 I/14); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2467* **Roberts Township**, Sudbury District (41 I/14E); Sudbury Data Series - Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2468* **Creelman Township**, Sudbury District (41 I/14, 41 I/15); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2469* **Tyrone Township**, Sudbury District (41 I/14); Sudbury Data Series - Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2470* **Kitchener Township**, Sudbury District (41 I/14); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2471* **Hutton Township**, Sudbury District (41 I/14, 41 I/15); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2472* **Foy Township**, Sudbury District (41 I/11,14); Sudbury Data Series - Preliminary Map. Data compiled by Richard Adlington, 1981.
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P.2473* **Bowell Township**, Sudbury District (41 I/11,14); Sudbury Data Series - Preliminary Map. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or inch to 1/4 mile.

P.2474* **Cartier Township**, Sudbury District (41 I/11, 41 I/12); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
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P.2475* **Levack Township**, Sudbury District (41 I/11W); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2476* **Morgan Township**, Sudbury District (41 I/11); Sudbury Data Series. Data compiled by Richard Adlington, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2477*** **Drift Thickness of the Ramore Area**, Cochrane and Timiskaming Districts (42 A/8). Compilation by C.L. Baker and assistants, 1979, 1980.
Scale 1:50 000.

P.2478*** **Drift Thickness of the Magusi River Area**, Cochrane and Timiskaming Districts (32 D/5). Compilation by C.L. Baker and assistants, 1979, 1980.
Scale 1:50 000.

P.2479*** **Drift Thickness of the Kirkland Lake Area**, Timiskaming District (42 A/1). Compilation by C.L. Baker and assistants, 1978, 1980.
Scale 1:50 000.

P.2480*** **Drift Thickness of the Larder Lake Area**, Timiskaming District (32 D/4). Compilation by C.L. Baker and assistants, 1979, 1980.
Scale 1:50 000.

P.2483*** **Quaternary Geology of the Magusi River Area**, Cochrane and Timiskaming Districts (32 D/5). Geology by C.L. Baker, K.G. Steele, A.A. Seaman and assistants, 1979, 1980.
Scale 1:50 000.

P.2484 **Quaternary Geology of the Madsen Area**, Kenora District (Patricia Portion) (52 K/13). Geology by V.K. Prest and assistants, 1978, 1979, 1980.
Scale 1:50 000.

P.2485 **Precambrian Geology of the Lingman Lake Area**, Kenora District (Patricia Portion), (53 F/14, 15). Geology by B.C. Wilson, C.C. Pelletier and D. Paktunc, 1981.
Scale 1:31 680 or 1 inch to 1/2 mile.

P.2486 **Drift Thickness of the Welland-Port Erie Area**, Southern Ontario (30 L/14, 32 L/15W). Compilation by B.H. Feenstra and M. Troper, 1975.
Scale 1:50 000.

P.2487** **Precambrian Geology of the Ardoch Area,** Southern Ontario (31 C/15). Geology by Liba Pauk and George Mannard, 1980.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2488** **Precambrian Geology of Belmont and Southern Methuen Townships,** Southern Ontario (31 C/5, 31 C/12). Geology by J.R. Bartlett, J.M. Moore Jr., M.J. Murray and assistants, 1980.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2489*** **Sand and Gravel Resources of the Ramore Area,** Cochrane and Timiskaming Districts (42 A/8). Compilation by C.L. Baker and assistants, 1979.
Scale 1:50 000..

P.2490*** **Sand and Gravel Resources of the Magusi River Area,** Cochrane and Timiskaming Districts (32 D/5). Compilation by C.L. Baker and assistants, 1978-1980.
Scale 1:50 000.

P.2491*** **Sand and Gravel Resources of the Kirkland Lake Area,** Timiskaming District (42 A/1). Compilation by C.L. Baker and assistants, 1978-1979.
Scale 1: 50 000.

P.2492*** **Sand and Gravel Resources of the Larder Lake Area,** Timiskaming District (32 D/4). Compilation by C.L. Baker and assistants, 1978.
Scale 1:50 000.

P.2493** **Paleozoic Geology of the Kemptville Area,** Southern Ontario (31 G/4). Geology by D.M. Carson and assistants, 1981.
Scale 1:50 000.

P.2494** **Paleozoic Geology of the Merrickville Area,** Southern Ontario (31 B/13). Geology by D.M. Carson and assistants, 1981.
Scale 1:50 000.

P.2495** **Paleozoic Geology of the Brockville-Mallorytown Area,** Southern Ontario (31 B/12,5). Geology by D.M. Carson and assistants, 1981.
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P.2496** **Paleozoic Geology of the Gananoque-Wolfe Island Area,** Southern Ontario (31 C/8,1). Geology by D.M. Carson and assistants, 1981.
Scale 1:50 000.

P.2497** **Paleozoic Geology of the Bath-Yorkshire Island Area,** Southern Ontario (31 C/2; 30 N/15). Geology by D.M. Carson and assistants, 1981.
Scale 1:50 000.

P.2498 **Precambrian Geology of the MacQuarrie Township Area,** Kenora District (52 E/8E,9E). Geology by G.W. Johns, Scott Richey and assistants, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2499 **Oil and Gas Pools and Pipelines of Southwestern Ontario** (40 G/10,15; 40 I/5,9-16; 40 J/1-3,7-10,16; 30 L/13-15; 30 M/3-5,11,12; 40 O/1; 40 P/1-12). Prepared by the Petroleum Resources Section of Ontario Ministry of Natural Resources, Southwestern Region, London.
Scale 1:250 000 (Stock No. 12123). Price: $1.50

P.2500 **Precambrian Geology of Keefer Township**; Cochrane District (42 A/5). Geology by A.G. Choudhry and assistants, 1981.
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P.2501 **Precambrian Geology of Denton Township**, Cochrane District (42 A/5). Geology by A.G. Choudhry and assistants, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2502 **Precambrian Geology of Thornelee Township**, Cochrane District (42 A/5E, 6W). Geology by A.G. Choudhry and assistants, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2512* **Castlewood Lake Area**, Thunder Bay District (42 E/13 NE); Thunder Bay Data Series. Data compiled by W.D. Love, 1981, 1982.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2513* **Pifher Township**, Thunder Bay District (42 E/13 SW); Thunder Bay Data Series. Data compiled by A.A. Speed, 1981, 1982.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2514* **Wilkinson Lake Area**, Thunder Bay District (42 E/13 SE); Thunder Bay Data Series. Data compiled by A.A. Speed, 1981, 1982.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2516* **Irwin Township - Jackpine Area**, Thunder Bay District (42 E/12 NW); Thunder Bay Data Series. Data compiled by A.A. Speed, 1981, 1982.
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P.2517* **Hezah Lake Area**, Thunder Bay District (42 E/12E); Thunder Bay Data Series. Data compiled by A.A. Speed 1981-1982.
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P.2518* **Partridge Lake Area**, Thunder Bay District (42 E/11W); Thunder Bay Data Series. Data compiled by W.D. Love, 1981-1982.
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P.2519* **Lindsley Township Area**, Thunder Bay District (42 E/11E); Thunder Bay Data Series. Data compiled by W.D. Love, 1982.
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P.2520* **Geraldton Area**, Thunder Bay District (42 E/10W) Thunder Bay Data Series. Data compiled by W.D. Love, 1981-1982.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2521* **Beardmore Area**, Thunder Bay District (42 E/12W) Thunder Bay Data Series. Data compiled by A.A. Speed, 1981-1982.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2522* **Vincent Creek Area,** Thunder Bay District (42 E/12E); Thunder Bay Data Series. Data compiled by W.D. Love, 1981-1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2523 **Geology and Mineral Deposits of the Bancroft Area, Western Part,** Southern Ontario (31 C/12; E/1; F/4). Geology by S.L. Masson and assistants, 1978, 1979, 1980. Scale 1:10 000.

P.2524 **Geology and Mineral Deposits of the Bancroft Area, Eastern Part,** Southern Ontario (31 F/4). Geology by S.L. Masson and assistants 1978, 1979, 1980. Scale 1:10 000.

P.2525* **Precambrian Geology of Cascaden Township,** Sudbury District (41 I/11,12). Geology by Jean Lafleur, N. Maerz, B.O. Dressler and assistants, 1980, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2526* **Precambrian Geology of Dowling Township,** Sudbury District (41 I/11). Geology by Jean Lafleur, N. Maerz, B.O. Dressler and assistants 1980, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2527* **Precambrian Geology of Trill Township,** Sudbury District (41 I/5,6,11,12). Geology by Jean Lafleur, N. Maerz, B.O. Dressler and assistants, 1980, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2528 **Precambrian Geology of the Wabigoon-Quetico Subprovince Boundary, Grand Bay Sheet,** Thunder Bay District (52 H/10). Geology by R.H. Sutcliffe, 1981. Scale 1:50 000.

P.2529 **Precambrian Geology of the Wabigoon-Quetico Subprovince Boundary, Shakespeare Island Sheet,** Thunder Bay District (52 H/9). Geology by R.H. Sutcliffe, 1981. Scale 1:50 000.

P.2530 **Precambrian Geology of the Wabigoon-Quetico Subprovince Boundary, Orient Bay Sheet,** Thunder Bay District (52 H/8). Geology by R.H. Sutcliffe, 1981. Scale 1:50 000.

P.2531 **Precambrian Geology of the Wabigoon-Quetico Subprovince Boundary, Black Sturgeon Lake Sheet,** Thunder Bay District (52 H/7). Geology by R.H. Sutcliffe, 1981. Scale 1:50 000.

P.2533** **Precambrian Geology of the Dalhousie Lake Area,** Southern Ontario (31 C/15). Geology by Liba Pauk and Gary Robertson, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2534 **Precambrian Geology of Pensyl Lake Area,** Sudbury District (41 P/12). Geology by G.M. Siragusa and assistants, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2535* **Muldrew Township,** Sudbury District (41 I/13; P/4); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2536** **Quaternary Geology of the Coe Hill Area,** Southern Ontario (31 C/13). Geology by P.F. Finamore and S.J. Courtney, 1980. Scale 1:50 000.

P.2537* **Gervais Township,** Algoma District (41 J/16); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2538* **Olinyk Township,** Algoma District (41 J/9, 16); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2539* **Tofflemire Townships,** Sudbury District (41 I/12); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2540** **Quaternary Geology of the Belleville Area,** Southern Ontario (31 C/3). Geology by J.G. Leyland and assistants, 1981. Scale 1:50 000.

P.2541** **Quaternary Geology of the Wellington Area,** Southern Ontario (30 N/14). Geology by J.G. Leyland and assistants, 1981. Scale 1:50 000.

P.2542* **Capreol Township,** Sudbury District (41 I/10); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2543* **Venturi Township,** Sudbury District (41 I/12); Sudbury Data Series. Data compiled by Richard Adlington, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2544* **Ermatinger Township,** Sudbury District (41 I/12); Sudbury Data Series. Data compiled by Richard Adlington, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2545* **Blezard Township,** Sudbury District (41 I/10, 11); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2546* **Cascaden Township,** Sudbury District (41 I/11, 12); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2547* **Garson Township,** Sudbury District (41 I/10); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2548* **Mandamin Township,** Algoma District (41 J/8, 9); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2549* **Vernon Township,** Sudbury District (41 I/5,12); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2550* **Totten Township,** Sudbury District (41 I/5,12); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2551* **Trill Township,** Sudbury District (41 I/5,6,11,12); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2552* **Gerow Township,** Algoma District (41 J/8); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2553* **Boon Township,** Algoma District (41 J/8); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2554* **Porter Township,** Sudbury District (41 I/5); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1;15 840 or 1 inch to 1/4 mile.

P.2555* **Cadeau Township,** Algoma District (41 J/8); Sudbury Data Series. Data compiled by Richard Adlington, 1982. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2556 **Precambrian Geology of the Terrace Bay Area, Northwest Sheet,** Thunder Bay District (42 D/14E; 42 E/3E). Geology by M.W. Carter and assistants, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2557 **Precambrian Geology of the Terrace Bay Area, Northeast Sheet,** Thunder Bay District (42 D/14E; 42 E/3E). Geology by M.W. Carter and assistants, 1981. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2558 **Quaternary Geology of the Brudenell Area,** Southern Ontario (31 F/6). Geology by P.J. Barnett and Brent Ainsworth, 1978. Scale 1:50 000.

P.2559 **Quaternary Geology of the Wiarton Area,** Southern Ontario (41 A/11). Geology by D.R. Sharpe, G.R. Jamieson, and assistants, 1977. Scale 1:50 000.

P.2560 **Drift Thickness of the Wiarton Area,** Southern Ontario (41 A/11). Compilation by D.R. Sharpe and assistants, 1977-1981. Scale 1:50 000.

P.2561 **Bedrock Topography of the Wiarton Area,** Southern Ontario (41 A/11). Compilation by D.R. Sharpe and assistants, 1977-1981. Scale 1:50 000.

P.2562 **Industrial Minerals of the Algonquin Region, Parry Sound Area,** Parry Sound and Muskoka Districts (31 D/13; 31 E/4, 5, 6, 11, 12, 13; 41 H/1, 8, 9, 10, 15, 16; 41 I/1, 2). Compilation by Wendy Martin, 1982. Scale 1:125 000.

P. 2563 **Industrial Minerals of the Algonquin Region, Bracebridge Area,** Parry Sound, Muskoka, Nipissing Districts and Southern Ontario (31 D/13, 14, 15; 31 E/2, 3, 4, 5, 6, 7, 10, 11, 13, 14; 31 L/3). Compilation by Wendy Martin, 1982.
Scale 1:125 000.

P.2564 **Industrial Minerals of the Algonquin Region, Algonquin Park Area,** Nipissing District and Southern Ontario (31 E/1, 7, 8, 9, 10, 11, 14, 15, 16; 31 F/12, 13; 31 K/4; 31 L/1, 2, 3). Compilation by Wendy Martin, 1982.
Scale 1:125 000.

P.2565 **Industrial Minerals of the Algonquin Region, Pembroke Area,** Southern Ontario (31 F/2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15; 31 K/3, 4; 31 L/1, 8). Compilation by Wendy Martin, 1982.
Scale 1:125 000.

P.2566 **Industrial Minerals of the Algonquin Region, Minden Area,** Southern Ontario (31 D/9, 10, 11, 14, 15, 16; 31 E/1, 2, 7, 8). Compilation by Wendy Martin, 1982.
Scale 1:125 000.

P.2567 **Industrial Minerals of the Algonquin Region, Bancroft Area,** Nipissing District and Southern Ontario (31 C/12, 13, 14; 31 D/9, 16; 31 E/1, 8, 9; 31 F/3, 4, 5, 12). Compilation by Wendy Martin, 1982
Scale 1:125 000.

P.2568 **Precambrian Geology of Musquash Township,** Algoma District (42 C/2). Geology by R.P. Sage and assistants, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2569 **Precambrian Geology of the Kawashegamuk Lake Area, Western Part,** Kenora District (52 F/8, 9). Geology by D.U. Kresz, C.E. Blackburn, F.B. Fraser, and assistants, 1980, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2570 **Precambrian Geology of the Kawashegamuk Lake Area, Eastern Part,** Kenora District (52 F/8, 9). Geology by D.U. Kresz, C.E. Blackburn, F.B. Fraser and assistants, 1980, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2571 **Precambrian Geology of Belanger and Bowerman Townships,** Kenora District (Patricia Portion) (52 K/15; 52 N/2). Geology by T.L. Muir, J.W. Graydon, and assistants, 1981.
Scale 1:15 840 or 1 inch to 1/4 mile.

P.2572 **Quaternary Geology of the Pakwash Area,** Kenora District (Patricia Portion) (52 K/14). Geology by M.J. Ford and assistants, 1981.
Scale 1:50 000.

P.2573 **Location of Seismic Lines in Southwestern Ontario, 1979; Goderich Sheet,** Southern Ontario (40 P/11, 12, 13, 14). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981.
Scale 1:100 000.

P.2574 **Location of Seismic Lines in Southwestern Ontario, 1979; St. Mary's Sheet,** Southern Ontario (40 P/3, 4, 5, 6). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2575 **Location of Seismic Lines in Southwestern Ontario, 1979; Wallaceburg Sheet,** Southern Ontario (40 J/9, 10, 15, 16; 4 O/1). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2576 **Location of Seismic Lines in Southwestern Ontario, 1979; St. Thomas Sheet,** Southern Ontario (40 I/11, 12, 13, 14). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2577 **Location of Seismic Lines in Southwestern Ontario, 1979; Tillsonburg Sheet,** Southern Ontario (40 I/9, 10, 15, 16). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2578 **Location of Seismic Lines in Southwestern Ontario, 1979; Chatham Sheet,** Southern Ontario (40 J/1, 2, 7, 8). Petrole Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ia Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2579 **Location of Seismic Lines in Southwestern Ontario, 1979; Ridgetown Sheet,** Southern Ontario (40 I/3, 4, 5, 6). Petroleum Resources Map compiled by Rae Booth-Horst, L.R. Laceby, Ian Cameron and Kathy Kriter, 1981. Scale 1:100 000.

P.2580 **Precambrian Geology of the Quinn Lake Area,** Algoma Distric (41 O/4W). Geology by G.M. Siragusa and assistants, 1976. Scale 1:15 840 or 1 inch to 1/4 mile.

P.2581* **Quaternary Geology of St. Joseph Island,** Algoma District (J/4,5; 41 K/1,8). Geology by P.F. Karrow and assistants, 1980, 1981, 1982. Scale 1:50 000.

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